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LONDON GUARANTEE BUILDING
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MONTHLY TRADE PUBLICATION

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The only independently published trade publication devoted exclusively to Porcelain Enameling and Ceramic Finishing on metal.

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Associate editors, PROF. A. I. ANDREWS
and PROF. R. M. KING.

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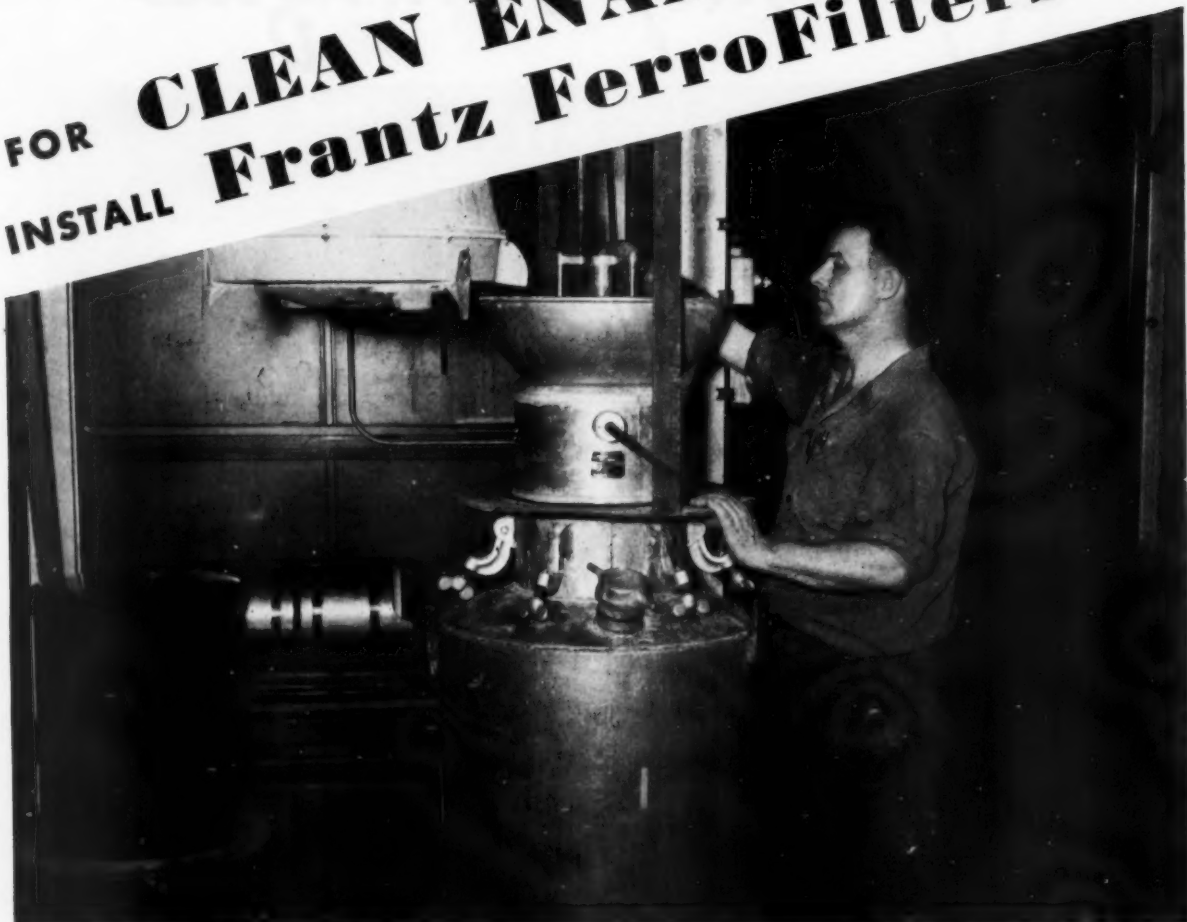


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- Material can not be "flooded" through the separator. Rate of output is controlled to make magnetic separation positive.
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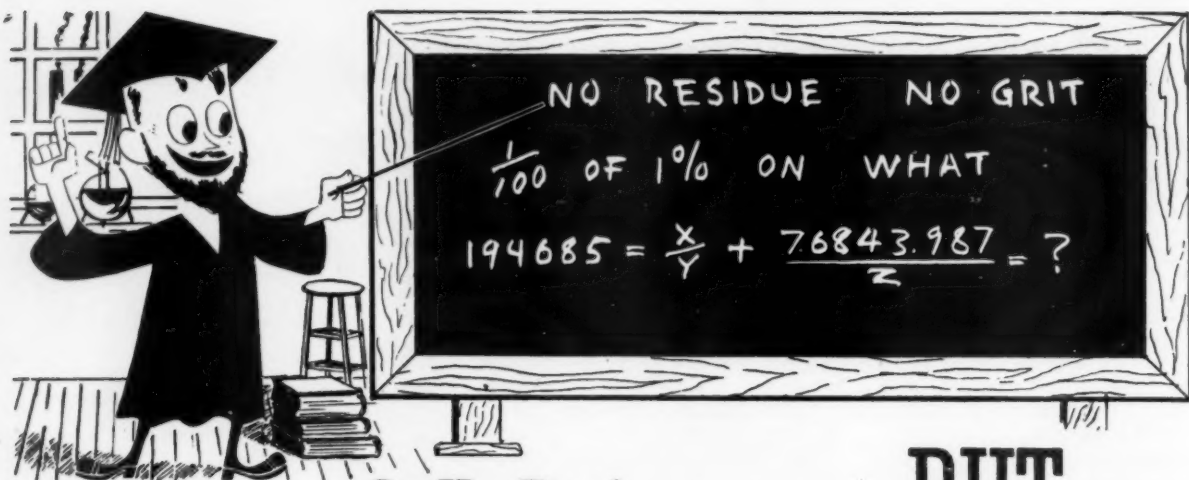
Announcing

When raw materials are again in supply, we will furnish you with new products, laboratory developed and production tested, that we are sure will be in great demand.

pioneers in pH cleaning . . . serving you since

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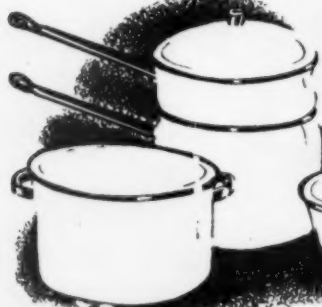
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Will the clay work in actual enamel plant production? OHCO Enameling Clays go beyond laboratory claims (and screen tests.) All that we have learned in 55 years about improving quality through better raw materials is incorporated in OHCO Enameling Clays. We mine and process our own Clays. Each step in production is controlled by our Ceramic Laboratories.

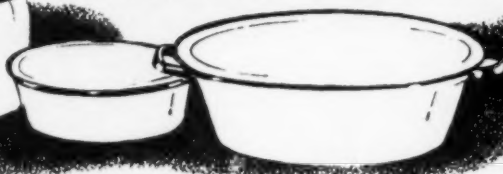
OHCO Enameling Clays will help you eliminate tearing, reboiling and strain lines. They will certainly contribute greater opacity and brilliance to white enamels. Your "set up" problems will disappear.

We shall welcome an opportunity to help you improve your porcelain enameled products, reduce costs and be of constructive service in your enameling plant.

OHCO Enameling Clays 842, 212, 999, 528, and 710 will definitely reduce operating production costs in the Enameling Plant.



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THE Finish Line

YOU WILL RECEIVE LIBERAL DIVIDENDS — if you read the following lines and then act on them promptly. We say this without reservation, for there is nothing on this page that is original with us. It is merely a reminder of available services to all those interested in furthering porcelain enamel and porcelain enameled products — services which *will* pay liberal dividends if you take advantage of them.

PEI forum for plant men

On September 10, 11 and 12, at Ohio State University, Columbus, Ohio, the 9th Annual Forum of the Porcelain Enamel Institute will be held. This Forum for plant men has grown in strength and interest each year but there are still many, many companies operating porcelain enameling plants who are not taking advantage of this opportunity to broaden the vision and effectiveness of their key plant men by sending them to this Annual Forum.

As in the past, this year's Forum has been built around the problems that currently face the industry—built, in fact, from questionnaire requests from plant men and executives suggesting specific subjects to be covered. Speakers have been chosen for their ability to discuss the assigned subject. In the words of Edward Mackasek, managing director of the Porcelain Enamel Institute:

"As an industry, we face a future of great opportunity as well as keen competition. To realize the former and meet the challenge of the latter, we must strive constantly to raise the standards of Porcelain Enamel quality and work for a maximum of plant efficiency. This can best be accomplished through industry-wide education. The Forum is designed to contribute to this end."

In those companies where no definite arrangements have been made, we suggest an immediate consultation between top management and key enamel plant men to determine the advisability of attendance so that immediate reservations may be made.

Sales and management conference

The second meeting of importance to our industry is to be held in connection with the Annual Meeting of the Porcelain Enamel Institute, scheduled for the Hotel Cleveland, Cleveland, Ohio, October 9 and 10. This year, with direction markers again pointing to an eventual buyer's market, the Institute will, for the first time, sponsor a Sales and Management Conference. This Con-

finish SEPTEMBER • 1947

ference comes at a most propitious time. Here's an opportunity for top management and sales management of the many companies manufacturing and selling porcelain enameled appliances and products to review the sales potential in porcelain enamel as a finish and to gather constructive ideas that can be used in future selling programs.



You should plan to use this new advertising emblem. Read more about it in this month's news section.

The Porcelain Enamel Institute has selected topnotch men in the field of selling as feature speakers, and during the full-day program of October 10 will show the how and why of porcelain enameling and demonstrate specific successful methods that can be used in a selling program.

In this instance, we urge top management to get together with sales management and determine representation for attendance at this meeting.

You must act now

To take advantage of the constructive possibilities of either or both of these meetings it will be necessary that immediate action be taken to insure accommodations. For reservations or further information, write direct to the Porcelain Enamel Institute, 1010 Vermont Ave. N.W., Washington 5, D.C.

Dana Chase
EDITOR AND PUBLISHER



A VISIT BEHIND THE SCENES. Here samples are being transferred from an Armco laboratory pickling solution to a rinse tank. The tanks simulate the set-up of cleaning, pickling and neutralizing used in an enameling plant. Constant experimentation is finding ways to improve the efficiency and control of these operations.

A great laboratory guards "Q.C." for you

The Armco Research Laboratories, in operation 45 years, give Armco customers the largest and oldest research organization in the field of special-purpose iron and steel sheets. One group devotes all its time to enameling problems.

Enameling specialists here and supervisors in the Armco mills work as a team to assure "Q.C." (Quality Control) on every order of ARMCO Enameling Iron. These men analyze the purpose for which your enameling stock will be used — how it will be fabricated into your products — under what conditions it will serve.

The answers are recorded on a routing card that

accompanies your *individualized* order all the way — from open-hearth furnace to shipping platform. You are assured of uniformity. And you have sheets made to order for *your* particular requirements.

"Q.C." in ARMCO Enameling Iron helps eliminate rejects — saves you many dollars on materials, time and labor. That is why so many enameleers have long preferred this fine enameling stock; also why we are working to the limit of our *quality capacity* so that you may have more and more of it for your needs. The American Rolling Mill Co., 781 Curtis Street, Middletown, Ohio.

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• SPECIAL-PURPOSE SHEET STEELS

• STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE



GRAND HOTEL, MACKINAC ISLAND, SCENE OF THE MEETING OF HOME LAUNDRY EQUIPMENT MANUFACTURERS.

AMERICAN WASHER AND IRONER MANUFACTURERS' ASSOCIATION

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Edward C. Doll, Lovell; Eduard Geldhof, 1900

A MOST interesting, enjoyable and profitable few days were spent recently in joining with the American Washer and Ironer Manufacturers' Association for its Mackinac Island meeting. Traveling by spe-

cial train, lake ferry and surrey, the washer-ironer group journeyed to the Island's Grand Hotel for business meetings, with a bit of recreation thrown in.

Under the able guidance of Presi-

dent Roy A. Bradt, vice president of the Maytag Company, the first day's meeting moved on schedule.

Association reorganization

As a result of increasing diversi-

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President Bradt delivers an optimistic message to association members.

finishfotos

Louis C. Upton, past president, receives a beautiful silver tray from the association, presented by Secretary Noelke.



fication in the home laundering equipment industry, with attendant multiplication of new engineering, production and marketing interests, the membership approved a plan for complete reorganization of the Association, now in its thirty-first year.

In the future, industry activities will be under the direction of four new closely integrated product divisions serving the automatic washer, conventional washer, dryer, and ironer manufacturing groups. Although automatic washers have been very much in the limelight, the fact still remains that over twice as many manufacturers make conventional type washers as those marketing an automatic or on record as planning to introduce one. Diversification in the industry has, for the most part, come within the past six years, and principally since the end of the war. Ironers have long been a part of the industry, but household dryers are almost without exception a post-war product.

Indicative of the increased manufacturing complexity in the industry, manufacturers at the Grand Hotel meeting pointed out that the organization's Association Members alone, 40 suppliers to the industry, sell the factories 115 materials, parts and equipment items in close to 400 types and styles.

Potentialities of the industry were declared by Mr. Bradt to be greater

than ever. "Nothing has successfully taken the place of mechanical washing of clothes in the home," he said. "The difficulty of obtaining adequate and satisfactory domestic help has given our appliances a deeper value in the home. A huge replacement market accumulated through the war. The export market promises to become larger than ever. High income families are more interested in washers than any of us had a right to expect a few years ago. Servants are making washers, dryers and ironers a condition of employment. The ironer market shows remarkable growth. Dryers jumped into acceptance in the past twenty-four months and are sure of a definite, sizeable, responsive market.

"I know of no other industry whose future is as promising and as rosy as ours."

Industry's present production would seem to back up Mr. Bradt's contention. Household washer output this year is expected to total more

than 3,500,000 units. Manufacturing of dryers and ironers is at record levels, and is higher than ever before in proportion to production of washers.

Comparator washer in use

Some of the plans afoot to make present-day washers do an even better job for the American housewife were outlined by G. I. Cockerill,

chairman of the Association's engineering and research committee, and chief engineer of Apex Electrical Manufacturing Company. As one part of the program, each member of the Association uses a standard "comparator" washer by which he is able to compare the washing performances of all models, and to design changes in his own if they are found not to equal others of similar price and capacity. It is expected that industry-wide comparison will soon be extended through a basic method for gauging the removal of water from washing in the various wringing processes. Water removal is being studied by a special subcommittee under Frank Breckenridge, chief engineer, Automatic Washer Company.

Cooperating with the American Institute of Architects, the committee is working for eventual "modular coordination" in kitchen and utility room planning. If this is brought about, appliance dimensions will be

multiples of a standard measurement unit, so that architects will be able to fit all major kitchen and home laundering equipment snugly into rooms built from materials of standard dimensions.

Another problem to be considered by the engineering and research committee is that of standardization of plumbing codes.

Better market information

"Competition demands that every manufacturer know where his merchandise is going, that he know where his competitors' products are going and that he also know where the buying potential is greatest and where it is weakest," M. A. Toussaint, vice president and general manager of the American Ironing Machine Co., told AWIMA members. Speaking as chairman of the Association's advertising and marketing research committee, Toussaint urged the manufacturers to report their sales by more than 600 market areas instead of by states, as at present, and recommended that a special conference of the Association's sales managers be held within sixty days to approve sales analysis methods for general adoption by the members.

The Association's manual for instruction in the use of the household washer, dryer and ironer, "Simple Ways to Better Cleanliness," has reached a distribution of almost 100,000 in the home economics departments of approximately 2,000 schools and colleges. The committee recommended that steps be taken to divert a small percentage of 1 per cent of the industry's production for properly equipping these institutions.

Counterfeit parts in use

The use of counterfeit parts in the repairing or rebuilding of household washers by irresponsible dealers is one of the problems to be considered by the new parts and service committee, according to a report prepared by C. L. Atkinson, Jr., committee chairman and sales service manager of the Easy Washing Machine Corporation, and read by A. H. Noelke, Association secretary.

Industry-wide cost analyses

G. W. Yeager, treasurer of the Dexter Company, and chairman of the organization's new cost accounting committee, announced plans for perfecting a method by which industry-wide cost analyses may be compiled for the information of all members.

Not all work

On the theory that "all work and no play makes Jack a dull boy," the program included a spirited golf tournament, with multitudinous prizes, and a banquet at which all officers and speakers were required to wear handlebar mustaches and derby hats.

Associates take over

An important section of the meeting was turned over to the Associ-

New Associates Committee

H. S. Smith, Chairman, Burgess-Norton Mfg. Company
F. P. Stratton, Briggs & Stratton Corporation
G. W. Green, B. F. Goodrich Company
T. C. Craig, Mullins Manufacturing Corporation
O. L. Earl, Acme Aluminum Foundry Company
C. C. Daily, Firestone Industrial Products Co.
H. C. Kunkelman, Blass & Laughlin, Inc.
N. L. Etten, Chamberlain Corporation
C. L. Huff, ex officio, Bliss & Laughlin, Inc.

ates group for a pre-arranged program of speakers and round table discussions. Principal speakers included:

C. L. Huff, vice president and general manager of sales, Bliss & Laughlin, Inc., and retiring chairman of the Associates Group, covered the subject of purchasing problems and the relationships between suppliers and finished product producers.

All ears were trained to the speaker's platform for the message of R. C. Todd, vice president of American Rolling Mill Company, who outlined the current situation with regard to sheet steel supply, with particular reference to porcelain enameling sheets.

In his talk, "Purchasing with a Purpose," Arthur G. Pearson, director of purchases, American Meat Institute, carried a further message to both purchasing personnel and top executives.

163 questions form basis for "round table discussion"

Final feature of the program was a "Round Table Discussion" on the fundamental relationships between management and purchasing. Purchasing agents, suppliers and top management within the home laundering equipment industry turned in 163 questions on the mutual problems of management and procurement. These were correlated to serve as the basis of a discussion in which H. W. Mateer, publisher of *Electrical Merchandising*, New York, appeared in the role of works manager, and Dana Chase, publisher of *finish*, that of purchasing agent. George L. Meyer, Jr., vice president of Stewart-Warner Corp., Chicago, and general manager of its Stewart Die Casting Division and the Bassick Company, former director of purchases for Stewart-Warner, and past vice president of the National Association of Purchasing Agents, presided as moderator.

Attention to the discussion was retained by such pertinent comments as "A contract calling for 'price at time of delivery' is a blank check for the vendor"—"There are purchasing agents who are price minded only and see nothing but the original price"—and—such questions as "Why doesn't management encourage conferences between sales, production and purchasing?"—"Why doesn't purchasing work closely with engineering on design changes so that costs of different materials may be considered before the design is complete?"—"Why doesn't management encourage closer cooperation between product engineers and buyers with regard to material specification on new products?"

Complete script for the Round Table Discussion has been printed and is available upon request to Bliss & Laughlin, Inc., Harvey, Illinois.



Today the **SPOTLIGHT** is on *Machinability*

In using the extensive line of B&L Cold Finished Bars, you can select the types and grades of steel best suited to give maximum results in your particular manufacturing operations.

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 by using **WIREBOUNDS**

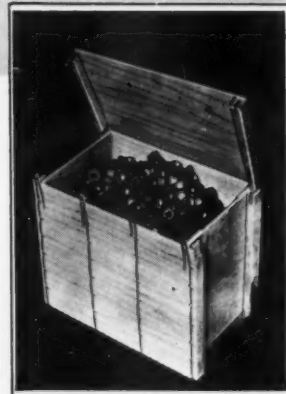
... \$200,000.00 saved through lower freight charges, reduced shipping damage costs, and more economical handling and storage made possible by Wirebound boxes and crates. Since starting to use Wirebounds eight years ago, company officials estimate that International Harvester has saved more than \$1,000,000.00 in shipping and container costs!

Each year, more than 300,000 Wirebound boxes and crates are used by the Harvester Company for shipping jobs such as these pictured here. Crankshafts, cylinder heads, complete gasoline engines, sheet metal parts and many other items are all shipped more economically and safely in Wirebounds.

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International Harvester Co. ships 75 pounds of tools in this Wirebound box with a tare weight of only 4-1/2 pounds!



This Wirebound box with a tare weight of 5 pounds is constructed to ship 150 to 200 pounds of small parts.



Note compact arrangement of component parts in this Wirebound crate used for shipping cream separators. Note Rock Fastener loop closure.



235 pound bull gear for an International Harvester tractor packed for shipment in a Wirebound box with Rock Fastener closure.

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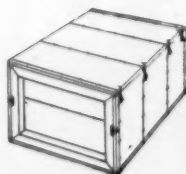
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FIRM NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

PRODUCT _____

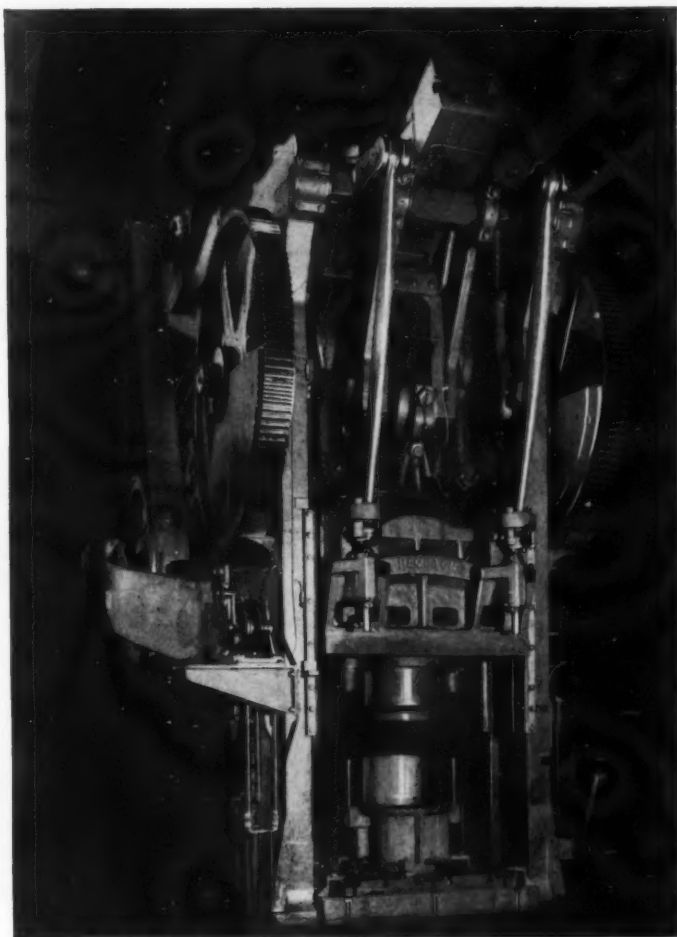


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☆

This press is hungry for steel

☆



The washing machine industry is still hungry for stamped tubs.

Mullins, its presses and its ovens are hungry too . . .
hungry for steel and other materials to make those tubs,
so we can keep them rolling along to you.

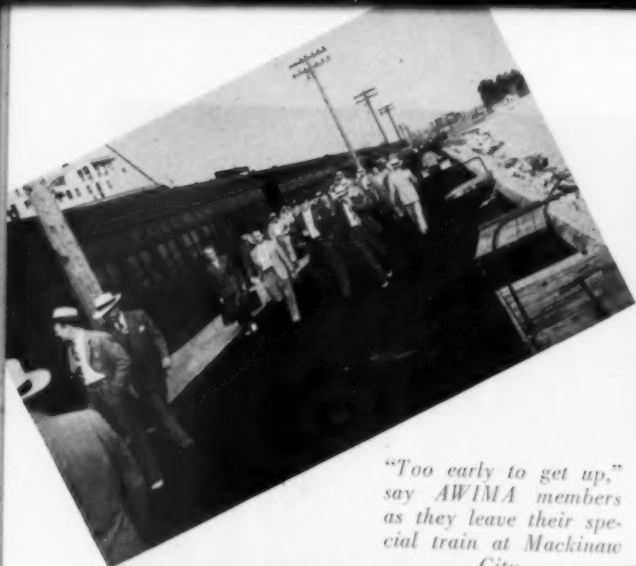
Because *your* problems in the washing machine industry
are *our* problems, Mullins hopes these shortages soon will cease to exist.
Meanwhile, we are doing everything possible to supply your needs.

This isn't the first headache in the history of mass production.
It won't be the last. But when it comes to hurdling obstacles, trust Mullins—
the pioneer in large-scale stampings—to keep working for *you*.



MULLINS MANUFACTURING CORPORATION
SALEM, OHIO

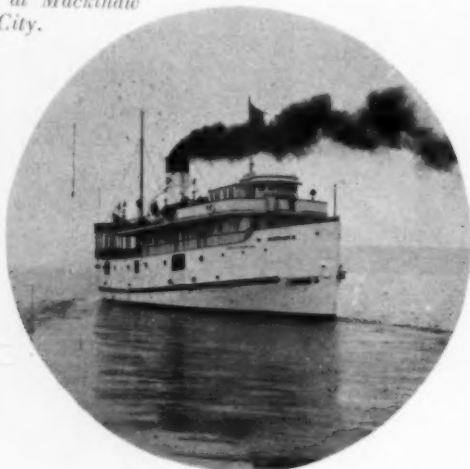
Design Engineering Service, Large Pressed Metal Parts, Porcelain Enameled Products



"Too early to get up," say AWIMA members as they leave their special train at Mackinac City.



Enjoying lake breezes are C. C. Daily, Firestone Products; H. S. Smith, Burgess-Norton; Walt Stevens, Electrical Dealer, and Arthur Pearson, of American Meat Institute.



Above left: "How do you run this thing," asks Engineer Geldhof, Nineteen Hundred Corp. Circle: To Mackinac Island via the Algomah II. Above right: Maytag's P.A., C. W. Clauser, takes his own pictures.

Left: Eager to get there, this group crowds as far forward as possible. Right: The West Coast's Little Giant, Inc., is represented by K. F. Keeje and Gerald Hecker, Jr.



Left: Enjoying another mode of transportation are Dexter's Yaeger and Rizor; Appliance Manufacturing Company's Shanks and Dunn; and Bill Bowden, of AllianceWare, Inc.

finishfotos

Right: Electrical Merchandising's Tom Blackburn gets a bead on Carl Huff for an informal portrait.





This worm's eye view of a golf threesome includes Automatic's Frank Breckenridge; Vernon Brumbaugh, of the Association; and Hotpoint's Lloyd Sweetland.



The New Monarch (Des Moines) Andersons — Clarence, Frank and Arvid—enjoy the jerry's sun deck.



Above left: H. A. Sperlich, of Ironrite Ironer, at the meeting. Circle: G.P.&F's Forsberg and Clarence Anderson try another mode of transportation. Above right: George Meyer, of Stewart Die Casting, and Arthur Pearson.

Left: Woody Williams and C. D. Anderson, of F. L. Jacobs Company. Right: Resting for the trip home are H. J. Mertz and M. J. Morton, of Beam Manufacturing Company.



Left: Shown here at one of the well attended AWIMA general sessions are W. G. Magnuson and L. G. Vanderhoof, both of Stewart Die Casting Division, Stewart-Warner.

finishfotos

Nineteen Hundred Corporation is represented in this session by F. S. Upton and W. S. Hammersley.





WITH top turned back, this Deluxe Simplex ironer is ready for the modern housewife's needs.

Streamlined, gleaming white, mechanically superb, the Simplex saves hours of hard, unpleasant hand work—does the family ironing so quickly and easily that women think it is fun to operate.

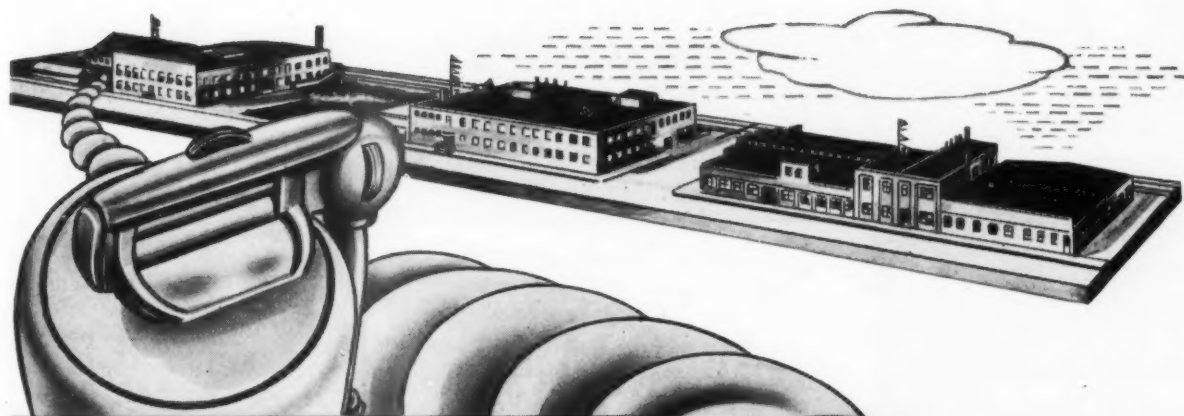
WITH top closed, the Simplex becomes a table. The VITREO porcelain enameled top gives a work surface that is not damaged by heat or acids.

It doesn't scratch or turn yellow. It is permanent, easily cleaned. It is the best working surface for domestic requirements.

To any ironer manufacturer who wants to build the maximum of value into his machine, we offer our experience in making special tops for these machines. Tell us your requirements.

VITREOUS STEEL PRODUCTS CO.

BOX 1791, CLEVELAND 5, OHIO (Factory at Nappanee, Ind.)



THEY LOOK TO NEW MONARCH FOR QUALITY LIDS AND OTHER WASHING MACHINE PARTS

Twelve of the large, nationally known washing machine manufacturers are using New Monarch lids and other stampings. Their selection is due to the uniformly high quality and precision craftsmanship which go into all New Monarch stampings and which have enabled them, throughout the years, to hold their most critical customers.

New Monarch will aid you, too, in the production of better and finer steel products.

New Monarch's service includes: Engineering, Planning and Developing your ideas; Making Dies, Jigs, Fixtures and Stampings; Complete Assembly and Finishing; Painting, Packing and Shipping.



When you think of Stampings, think of

NEW MONARCH MACHINE & STAMPING CO.

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Since 1934 . . Suppliers of porcelain enamel tubs and parts to leaders in the washing machine industry.

ALLIANCEWARE, INC. • Alliance, Ohio

The sheet steel problem

a discussion of three factors—price, "black market" and adequacy of supply

By R. C. Todd • VICE PRESIDENT, THE AMERICAN ROLLING MILL CO., MIDDLETOWN, OHIO

NEWSPAPERS, trade magazines and publications of every type have been covering the problem of steel from all angles. Some of the material is unquestionably based on field research and factual data; other articles, of an editorial nature, have carried much questionable information and, in many instances, implications that may not be based on fact.

In an earlier issue of *finish* (February, 1947), under the title "Sheet Metal Outlook for 1947," I showed production comparisons for sheet metal products, and presented present and estimated future sheet production compared with 1941, listing new cold rolled sheet capacity and, indicating the quarter in which new capacity was expected to take effect.

Three important current problems

In this discussion I will cover three problems of current importance to all industries:

1. The relative fitness of present standard market prices.
2. The extent to which the steel industry might be a party to black market operations.
3. The question of the capacity for sheet steel production to serve the nation's requirements.

Steel prices

As will be remembered, steel prices were frozen by OPA on April 16, 1941, which covered prices for the first quarter of that year. Conditions affecting the increased cost of steel making since January 1, 1941, include: scrap, zinc, coal, fuel oil, silica brick, shipping lumber and iron ore. While there has been some increase in the selling price of steel since that time, the accompanying table will indicate the inadequacy of the price changes. As can be seen from Table II, the normal advances on selling prices of enameling sheets were woefully in-

adequate to take care of the cost increases that have occurred during the same period.

The steel industry has been conscious of its responsibility to keep down the selling price of commodity steel. What we were able to do, I regret to say, was to subsidize the commodity grades by profits from other lines. It is unwise and unhealthy to sell any product for less than its justifiable price.

Before the recent coal wage advance, commodity grades of steel sheets were selling at from \$7.00 to \$10.00 per ton less than what those grades were able to contribute toward profits in 1940 and 1941. Now, with coal up 80¢ a ton, it may create another increase in cost of \$2.00 a ton and that, with the prospective increase in freight rates, makes it un-

certain as to how far selling prices should advance."

The steel industry and black market operations

As for black market steel, I am confident that most of those who will read this article have complete knowledge and faith that none of the established and well-thought-of steel companies would indulge in such nefarious price practices.

We have dozens of examples where our own steel sheets somehow or other have slipped into the so-called black market and sold at from 12¢ to 13¢ a pound. We learned later that these sheets were obtained on government housing priorities and even for military purposes, and then resold at exorbitant prices.

Whenever we found anyone guilty of this practice, we saw to it that they received no more steel from us.

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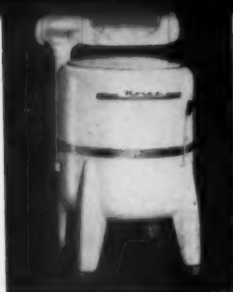
Table I.
Price Increases Since 1941

	January 1941 Price	January 1947 Price *	% Increase
ARMCO H. R. Base Rate	62.5¢	\$ 1.14*	+82
No. 1 Scrap—G.T.—Pgh.	\$22.13	\$32.50	+47
Zinc—Per Lb.—E. St. L.	7.65¢	10.5¢	+37
Pocahontas Coal—Per Ton—F.O.B. Mine	\$ 1.69	\$ 3.93	+133
Fuel Oil—Per Gal.	3.6¢	6.3¢	+75
Silica Brick—Per M.	\$47.50	\$70.00	+47
Shipping Lumber—Per M.	\$25.00	\$47.50	+90
Iron Ore—G.T.—L. Erie	\$ 4.48	\$ 5.30	+18
Commodity Steel Sheets Per Ton	\$56.70	\$70.50	+24

* Effective April 1

Table II.
Sheet Steel Prices Per Ton

Grade	1941 Aver. Price	Increase Since 1941	%
Hot Rolled	\$45.00	\$ 11.00	-24
Cold Rolled	59.00	7.00	-11
Enameling	67.00	12.00	-18
Galvanized	70.00	20.00	-28



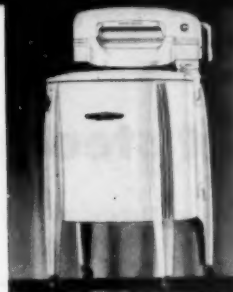
Norge



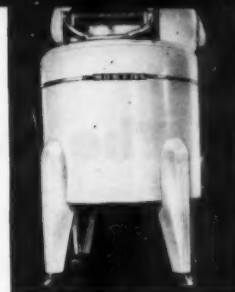
Automatic



One Minute



Speed Queen



Horton

A new challenge to purchasing

a message for the purchasing agent and for top management

By *C. L. Huff* • VICE PRESIDENT, BLISS & LAUGHLIN, INC., HARVEY, ILLINOIS

A FRESH challenge is being made to purchasing agents today. Providing for production during the war period required a display of great skill and ingenuity. Unfamiliar materials and processes, strange specifications and new products complicated a task already made difficult by the system of allocated orders, priorities and general scarcities . . . But in spite of our hopes and glittering visions, the end of the war was by no means the end of the difficulties. In some cases the old troubles just remained, while in others they were replaced with new and equally perplexing ones. . . .

To purchasing agents, especially the newer ones, it often seems that 10 per cent of the buying brings 90 per cent of the trouble, and I know there are days when 1 per cent of the buying may seem to cause all the trouble. Since the end of hostilities you have heard suppliers say, with a thousand variations, "We will try to get it for you," or "Yes, we can make that delivery." As these very words are uttered both the purchasing agent and supplier are making mental reservations about the actual foundation for the statement. Because as a purchasing agent you are forced to accept vague

and indefinite statements of this sort and place orders on this basis, you are no longer able to exercise the skills or the prerogatives of your position as a purchasing agent.

This places the purchaser in a very difficult position since he is responsible to his management to give them promises and assurances which will be the foundation for production scheduling. In order to discharge this responsibility, the purchasing agent must either investigate his source or restrict himself to dealing with established and reputable organizations. But, says the purchaser, some of the old suppliers are no better than the fly-by-nights, or the new ones that we have established ourselves with, and I wonder who you can count on. Sad to relate, this situation does exist. Too many suppliers are knowingly misleading the buyer in order to get the orders on the books and are making mental reservations that the promises may be modified later. In other cases, the suppliers' representatives are not kept fully informed of the conditions existing and the misstatements are made unintentionally. It is the supplier's definite responsibility to do everything possible to see that his promises are made in good

faith and it is the duty of his home office to keep him informed of developments which would prevent the promise from being kept. It is more than a responsibility. It is a life insurance policy. . . .

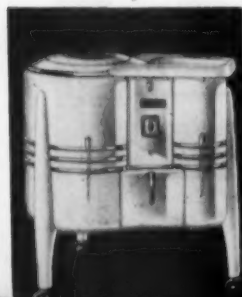
The question of price

One of the most pressing problems in the past has been a matter of delivery and fulfillment of commitments, but with each passing month this problem eases and another appears after many years of peaceful slumber. More and more the housewife, the purchasing agent and management, are asking, "What is the price?" On the day when prices overbalance delivery the smallest fraction, the purchasing agent will again be what he should. . . .

The old gods of cost and quality were set aside during the all important period of reconversion when new men became a part of purchasing. Only recently have buyers again become slightly price conscious, but still not enough of the newer men have had a full awakening along price and cost lines. Purchasing agents are responsible to their management to obtain value, and suppliers are responsible to the pur-

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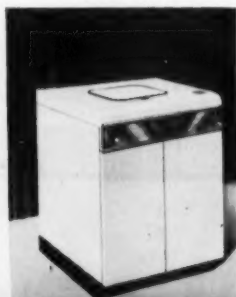
Easy



Hotpoint



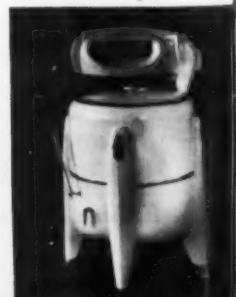
Blackstone

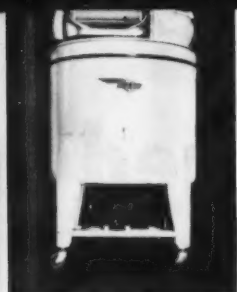


Frigidaire

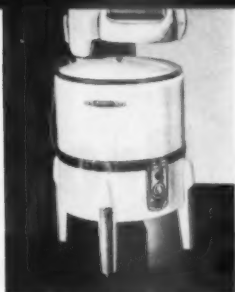


Whirlpool





Voss



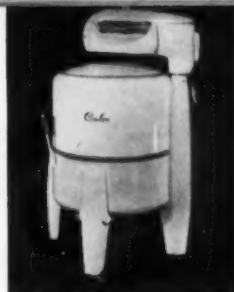
Universal



Duchess



Maytag



Conlon

Shown are photos of home laundry equipment received before closing date. More photos are shown on Page 57.

Purchasing with a purpose

is your purchasing agent an errand boy or an executive?

By Arthur G. Pearson • DIRECTOR OF PURCHASES, AMERICAN MEAT INSTITUTE

WE must recognize that purchasing today is organized and operated at many levels in business. In some organizations we find purchasing departments that are hardly more than errand boys, while in other organizations the purchasing departments consider their work an executive responsibility. The executive purchasing agent, the man who daily contributes more than a clerical operation to his company, hears constantly in mind that his job is that of a specialist in vendor relations.

All of this executive activity on the part of the purchasing agent leads to increased efficiency that gives more value for less money—whether it is saving the salesman's time and enabling him to be more efficient through good salesmanship or whether it applies to purchasing of raw materials and supplies. The contribution of the purchasing agent today, the man who is a real specialist in vendor relations, is to add efficiency to the work of his own department and the organization for whom he works.

Purchasing from an organizational point of view is a staff function. It does not give orders to the other departments in the company, but

rather is a source of ideas and suggestions which the purchasing department, as a specialist in vendor relations, is able to offer to the other departments of the company. It is in this capacity, as a specialist in procurement, that a purchasing agent contributes so much to his company. The extent of this ability to do *purchasing with a purpose* can be evaluated. To do this, there is probably no better way than to take the twelve principles of efficiency enumerated by Harrington Emerson in his study on that subject, and evaluate your work and your purchasing department on its ability to measure up to these twelve principles of efficiency. These are:

1. *Clearly defined ideas.* This matter of having clearly defined ideas enables the individual to have an appreciation of what he accomplishes from day to day and furnishes a psychological drive that makes the job more enjoyable and helps the individual to accomplish more, more efficiently.

2. *Common sense.* Common sense is the result of combining knowledge with experience.

3. *Competent counsel.* First, of course, are the men in your own organization to consult, and the men in your plant can help you. The second source of competent counsel is the salesman that call on you. Salesmen are the eyes of the purchasing department. It is through salesmen that a purchasing agent sees what is going on in the outside world. The third source of competent counsel comes from one of the greatest and most

unique of business organizations, known as The National Association of Purchasing Agents.

4. *Discipline.*

5. *Fair deal*—a very important consideration—a fair deal to others, as well as to yourself. Be fair to your employees; be sure they understand what their work is and what they are expected to accomplish each day. Be fair with other departments in your organization and be fair, above all, in your dealings with salesmen.

6. *Records* — reliable, immediate, and adequate. One record that is very helpful is one that some people call a "prospect file." This is maintained in the form of a commodity file, but is used to hold literature and information received concerning new sources of supply or new products. Such a file answers a pertinent need in the purchasing department to retain and hold information that comes to the attention of the purchasing agent, either through his contact with salesmen or through direct mail advertising which is constantly reaching the purchasing agent's desk.

7. *Dispatching.* It means getting the work started and finished on time.

8. *Standards and schedules.* Today, this subject is called personnel. There is nothing crueler to an individual than to put him on a job that he is not capable of handling easily and adequately. You wouldn't hitch a race horse to a milk wagon, nor would you expect a dray horse to win a derby just because he was entered in the race.

9. *Standardized conditions.*

10. *Standardized operations.* As conditions are standardized in other departments, the requisitions for materials, labor and supplies will become standardized with subsequent economies in buying.

11. *Written standard practice instructions.*

12. *Efficiency reward.*

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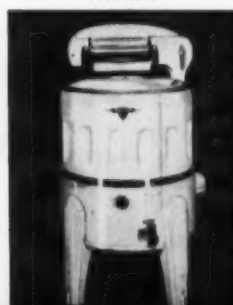
Young

Lauderall

General Electric

Barton

Hamilton



De-ionized Water Produced by ILLCO-WAY Equipment

... is used in the manufacture of refrigerators, mirrors, cosmetics, pharmaceuticals, and in a great number of metal finishing plants

● The compact ILLCO-WAY installation shown at the right produces pure water for the preparation of slip used in the enameling of refrigerators.

● With De-ionized Water, the slip is controlled accurately and reliably, and accurate control of ground coat set is assured. The surplus water drains off evenly, leaving a good cover on the steel.

● This is only one example of how ILLCO-WAY De-ionizers are providing chemically pure process water ... at a fraction of the cost of distilled water—10,000 gallons for less than a dollar.

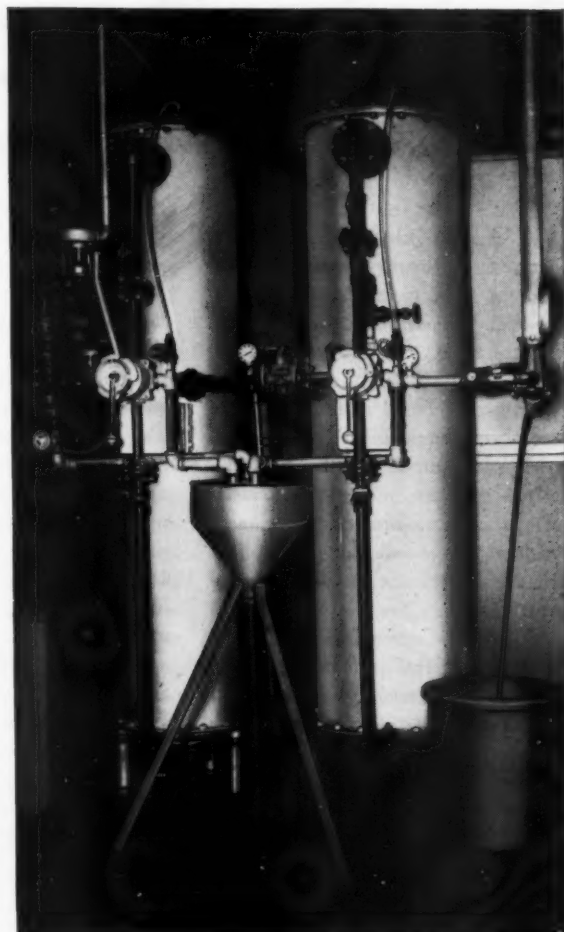
● Daily, more enamellers and metal finishers are finding a short-cut to a better product at lower costs by using ILLCO-WAY De-ionizers.

● A superintendent of a Midwest plant reports that his ILLCO-WAY equipment has proved so effective that little adjustment of either ground coat or cover coat has been made since the De-ionizer was installed. Solids content is kept below 0.5 gpg.

● These and many other ceramic and finishing problems are solved with ILLCO-WAY equipment, especially designed to meet your needs. Write for literature today.

ILLINOIS WATER TREATMENT CO.

866-9 Cedar Street, Rockford, Illinois
7310-R9 Empire State Bldg., New York City



OPERATING PRINCIPLE—Raw water passes in series through two reactor tanks containing high-speed, high-capacity, ion-exchange resins. These resins have the property of adsorbing and exchanging all the cations and anions in the water supply, giving an effluent water that is equal in purity to distilled water. No heat, no fuel, no cooling water involved in the process. Units are compact, requiring small floor space and little attention. There are only a few simple valves and minimum piping. The range of flow rates is practically limitless. Water is used here as an example but the same operating principle applies to the De-ionization of any liquid.

Finishing problems solved with

ILLCO-WAY

Water Treatment Engineering

A completely new porcelain enameling plant for refrigerator production

a refrigerator liner can be on its way to assembly
just 1 hour and 45 minutes after it enters the pickling machine

Illustrated with finishphotos exclusively

By H. C. Ellinger

• SUPERINTENDENT, PORCELAIN ENAMEL DEPARTMENT, PHILCO CORPORATION
PHILADELPHIA, PA.



In selecting a site for the production of electrical refrigerators and home freezers, Philco Corporation picked a spot that is unusual in its surroundings as a manufacturing plant. As you drive up Wissahickon Avenue past the plant, you are impressed more with the idea of a park or residential atmosphere than that of an industrial establishment. Inside, however, the story is quite different.

In starting from scratch, our plant engineers were able to select the latest type of equipment for every operation and, as you can imagine, this point alone was of great importance in connection with the layout of the porcelain enameling plant and the equipment installations.

The building is of saw-tooth construction, and the resulting abundance of daylight is supplemented with the latest in fluorescent lighting throughout the plant.

All major operations completely enclosed and mechanized

While our porcelain enameling division was in the planning stages for many months, this planning was of such recent date that it enabled our engineers to include the latest innovations in equipment and mechanized facilities. Each major operation is completely enclosed as a separate and distinct unit, but all of these units taken together form an unusually compact whole.

Conveyor lines were designed to eliminate practically all manual handling except at transfer points, and

the spaces for these were held at a minimum consistent with the size of the parts to be run.

Overhead storage facilities for milled enamel

Our frit storage is on the same floor with, and in a room adjacent to, the mill room. Mill batches of frit and mill additions are loaded into conical-shaped loading hoppers (1,000 lb. capacity). These hoppers are raised above the mills by monorail hoist for loading. The mills, of which there are three 2500-lb., one 1200-lb., one 1000-lb., and one 600-lb., are spaced so that a loading platform serves each of two mills. We use synthetic distillation for all water used in the mill batches.

All mills are water cooled. The cooling system consists of a copper line feeding a flat spray nozzle, which covers the top of the mill with a fine spray without appreciable water consumption.

New grinding balls are graded from 3" to 2". A typical 2500-lb. mill ball charge is controlled by holding it to 33" from top of the ball charge to top of door opening. This charge was pre-determined by tests so that the loader does not have to consider weight when charging the balls. This mill is then charged with 2500 lb. of frit and necessary mill additions.

The enamels we are using consist of a three-way ground coat—a so-called "soft" combination—and both zirconium and titanium cover coats for specific purposes.

Milled slip is unloaded by air, at 15-lb. pressure through a 30-mesh screen, into an unloading tank

mounted on a portable dolly together with pump and pipeline type magnetic separator. This unit (one for ground coat and one for cover coat) transfers slip to overhead storage tanks mounted 11' above the floor level. The six overhead tanks have a capacity of 375 gal. each. They are constructed of 12 gauge steel and protected with porcelain enameled ground coat. All tanks are equipped with motor driven agitators which are controlled by a time switch to operate about one-third of the time.

Liquid enamel flows from the storage tanks by gravity, through a screening device and magnetic separator, into the production line containers. All cover coat goes into 60-gal. pressure tanks for the spray line. All ground coat goes to 30-gal. porcelain enameled cans for transfer to the dip tanks.

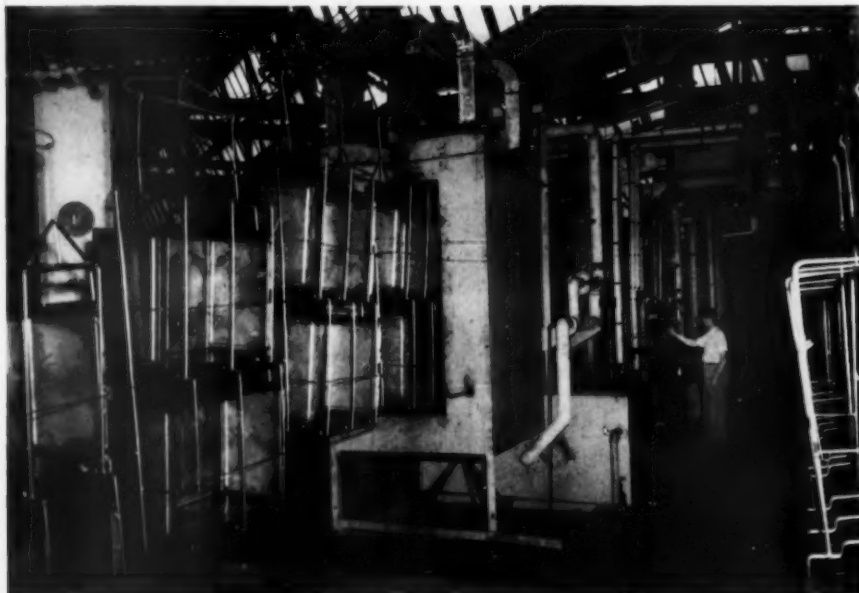
The screening unit and magnetic separator are mounted on a carrying frame constructed of steel plate and angle iron. This frame is in turn supported by a chain hoist mounted on a monorail conveyor serving the length of the mill room. Here, again, there are two units—one for ground coat and one for cover coat.

General control laboratory

The control laboratory, immediately adjacent to frit storage and the mill room, houses all of the essential equipment for checking of materials and control of operations. A standard chemical bench holds titrating equipment for the pickle room, a laboratory furnace, rotap machine, electrical thickness gauge, binocular microscope, photovolt meter for opacity and color checks, multiple unit

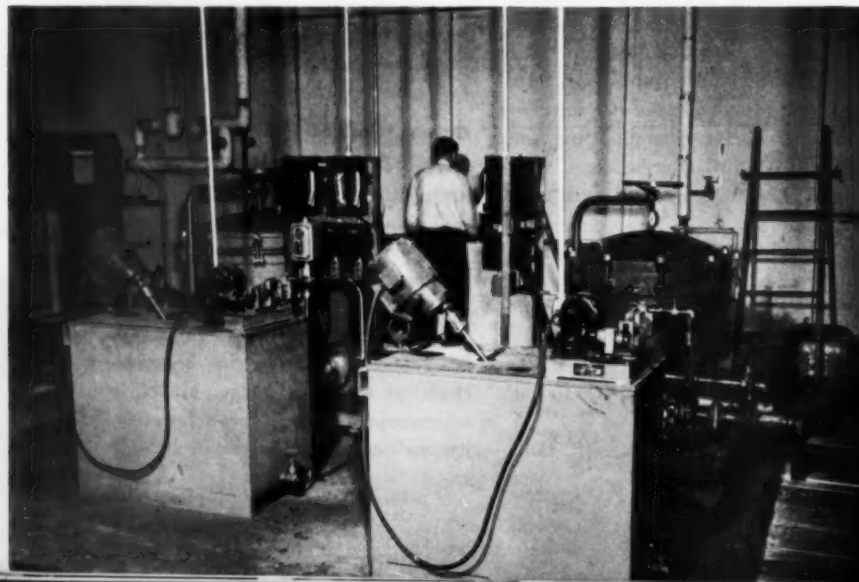


Tank, pump and closed type magnetic separator are ready for unloading the mill.



Food compartment liners entering continuous pickling machine. Note special racks.

This equipment provides continuous filtering for neutralizer and nickel solutions.



hot plate, chemical balance and a torsion balance scale. Near by are laboratory jar mills and a standard exhausted spray booth.

Continuous pickling equipment of spray wash type

A completely enclosed, spray-type pickling machine runs along one side of the enameling department, takes a right angle turn, and extends to a point midway along the end of the department. With this design, the ware can be loaded from the plant service conveyor which brings fabricated parts to the enameling department and unloaded at the other end immediately adjacent to ground coat dip tanks.

The pickle machine may be described as having ten sections as follows: (1) emulsion cleaner, (2) rinse (cold), (3) alkali cleaner, (4) three-stage rinse — the third stage is fresh city water, recirculated to stage 2, then to stage 1, and then to the sewer, (5) acid (7% sulphuric at 160°F.), (6) acid rinse (re-circulating rinse to remain on acid side), (7) nickel sulphate, (8) sodium cyanide (130°F.), (9) borax rinse (low concentration, 130°F.), and (10) drier.

This drier is gas-fired into a plenum chamber, the inner wall of which is composed of air nozzles on about 12" x 18" centers. The air is forced by fan through these nozzles to dry the ware from both sides.

Conveyor carriers for the pickle machine are Philco designed and hold two of the largest size refrigerator food compartment liners. These conveyor carriers are of welded construction, and are fabricated entirely of 1/2" and 1/4" alloy rod.

A complete filtering system is installed inside the "L" formed by the pickling machine so that both the neutralizer and nickel tanks are automatically filtered. This filtering system is cleaned every 40 hours.

Thermostatic control is handled through the installation of controllers on all hot solutions together with a 6-point recorder for visible and permanent record.

Ground coat application

Upon leaving the pickle machine drier, the clean steel parts are trans-

ferred immediately to a roller gravity conveyor serving the ground coat dip tanks. Dip tanks are 4' x 10', with recirculating system, including pumps and pipeline magnetic separators. A stationary screen is mounted at the corner of each tank.

The floor in the dipping area slopes to a central drain and into a sump. This section is washed down with a hose every shift.

Three-pass convection drier

The ground coated parts are then hung on an overhead conveyor which enters a 60' long drier of sufficient size to house three passes of the conveyor chain. Total conveyor length is 180'. The drier is convection heated, employing an indirect fired oil heater plus a furnace recuperator. It can be operated up to 450° F. It is currently used at 275° F. to 300° F. at a conveyor speed of 15' per minute.

Upon leaving the ground coat drier, the conveyor chain enters an 8' elevated reenforcing booth. This water wash type booth is designed to employ two operators. The conveyor then continues on to a transfer point to the furnace chain.

Near the entrance end of the furnace is a semi-enclosed and suction-ventilated blow-off booth for the dried ware.

Eleven-burner furnace

has 59' hot zone

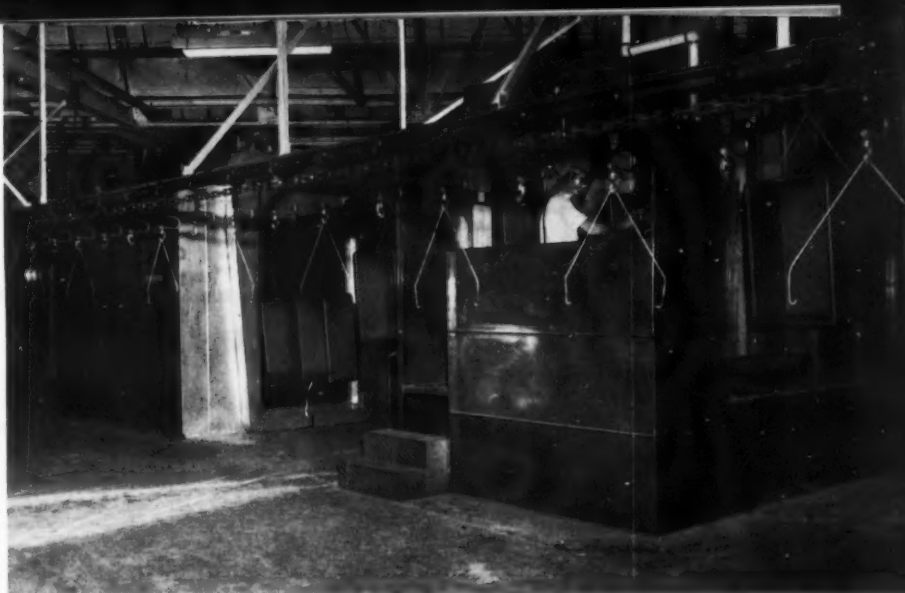
The furnace installation is of the U-type and has 6' high sidewalls and a 59' hot zone. Normal chain speed, with the chain fully loaded, is 21' per minute. Firing of both ground and cover coat enamels is at 1550° F.

Furnace chain loops cover coat loading station

Ground coated ware leaving the furnace follows a loop in the furnace conveyor chain designed to feed the cover coat loading station. Here the ware is transferred to the cover coat conveyor line, which runs the complete length of the department to feed the finish coat spray room and also serves as a bank of ground coated parts. This helps to eliminate any

to Page 34

See plant layout . . . Pages 32 & 33



Food compartment liners leaving ground coat dryer through reenforcing spray booth.



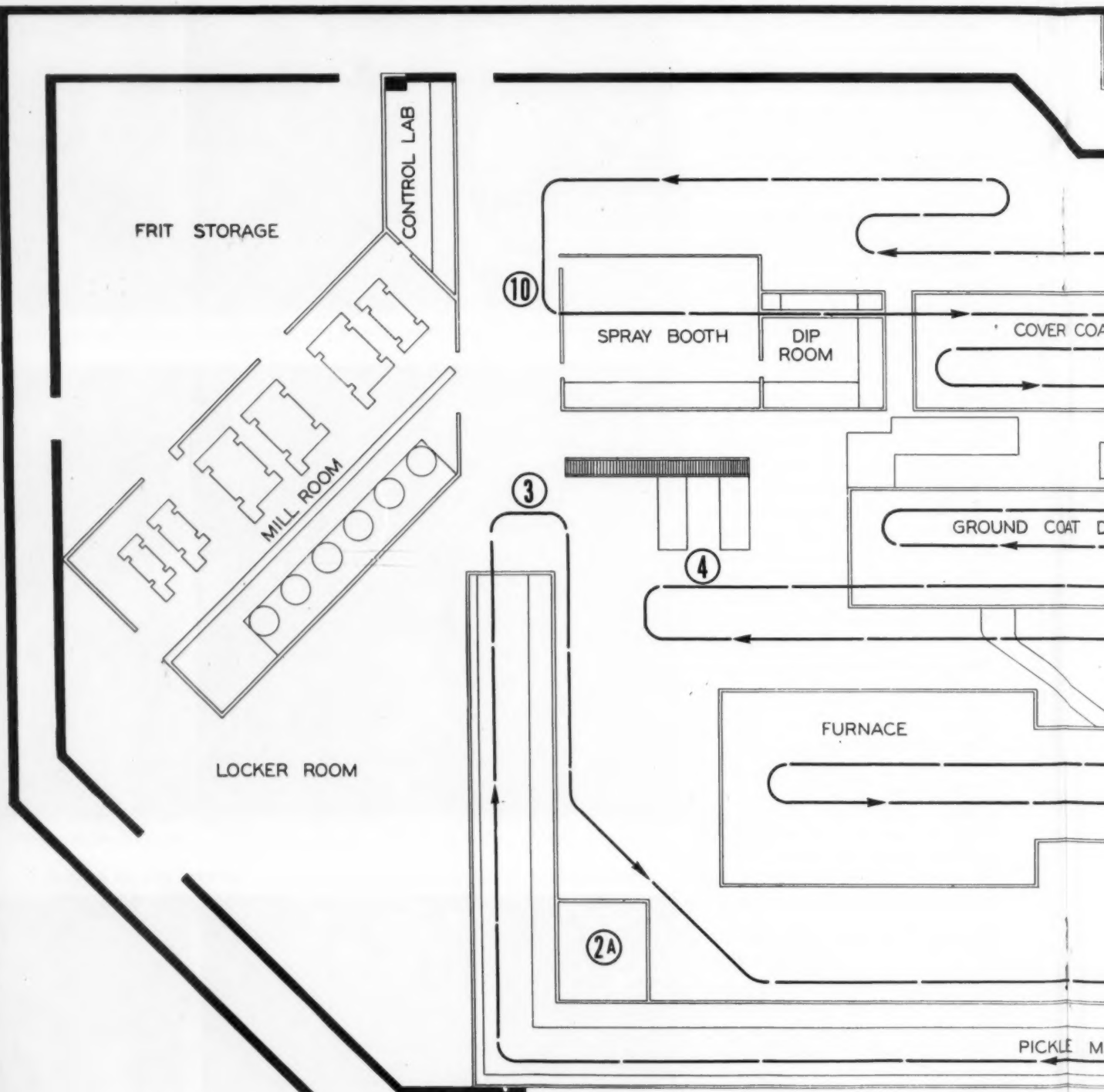
View of interior of first section of the pressurized cover coat spray room.

Entrance side of U-type continuous furnace showing exhausted blow-off booth at left.



The Philco plant . . .

a completely new porcelain enameling plant



1. Plant service conveyor at point of transfer of raw fabricated parts to conveyor of pickling machine.

2. Fabricated parts enter the continuous pickling machine.

2A. Automatic filtering equipment serves both the nickel and neutralizer sections of the pickling machine.

3. Point of transfer of clean dry parts to roller gravity conveyor serving ground coat dip tanks.

4. Ground coated parts are loaded on dryer conveyor.

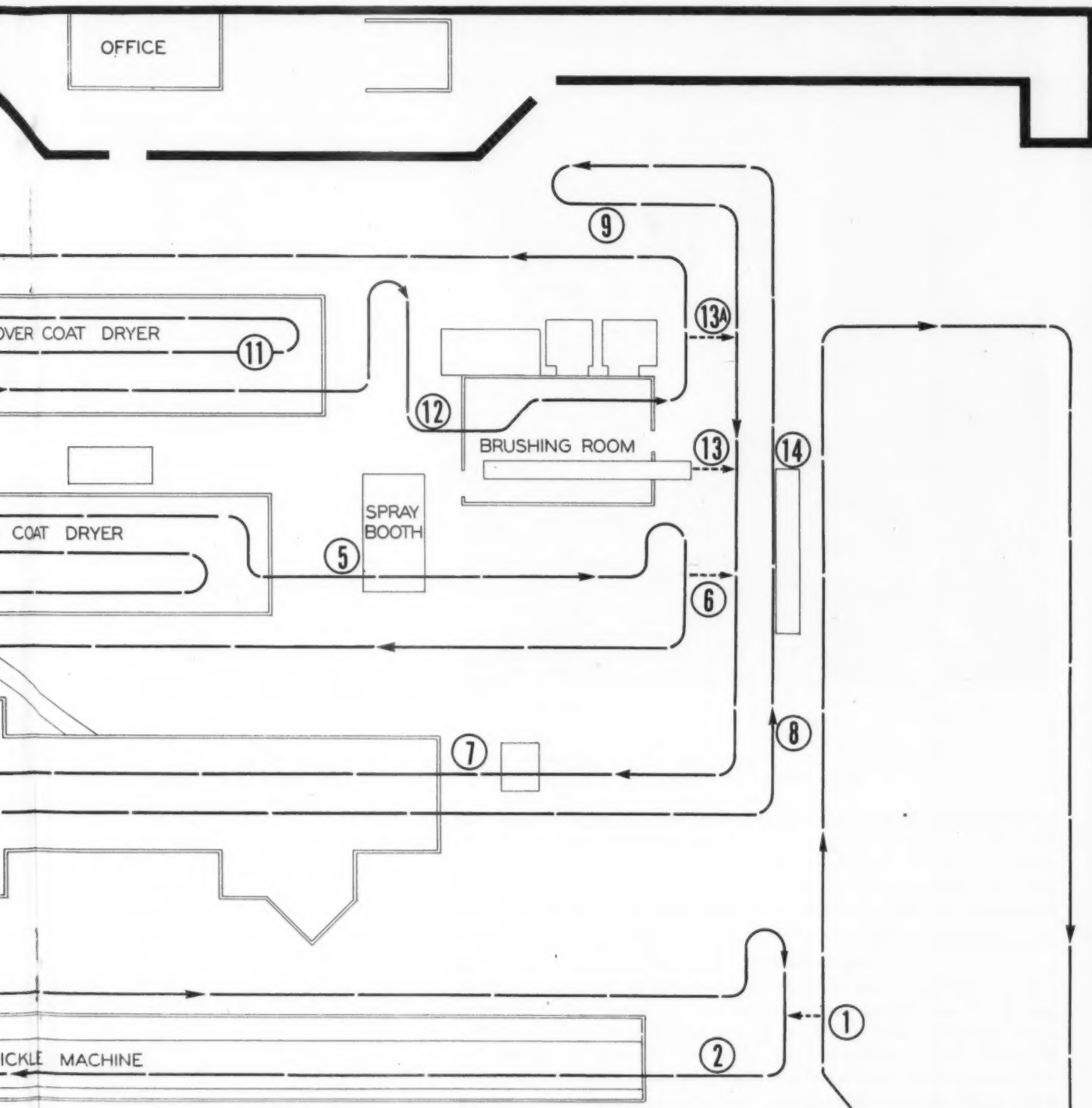
5. As parts leave ground coat dryer, they pass through an elevated re-enforcing booth.

6. Transfer point for ground coat to furnace chain.

7. Entrance to U-type continuous furnace. Drawing shows blow-off booth near entrance.

8. Furnace chain delivers fired ground coat to cover coat spray conveyor.

Plant for refrigerator production



9. Ware is transferred from furnace chain to finish coat spray conveyor.

10. Fired ground coat enters pressurized spray room.

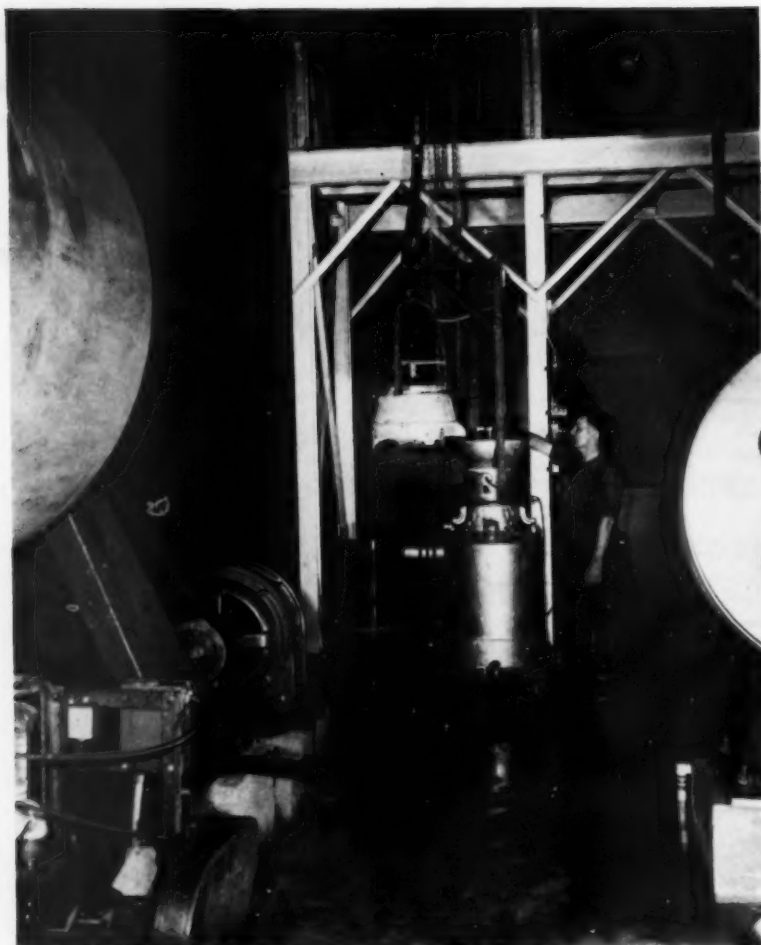
11. Dryer conveyor covers three lengths of dryer.

12. Pressurized brushing room has overhead conveyor for liners, flat type conveyor for small parts.

13. Small parts such as crispers, evaporator doors, crisper fronts, etc., are transferred to furnace chain at this point.

13A. Liners and large parts are transferred to furnace chain here.

14. Final inspection area for all finished parts. OK'd ware is transferred immediately to plant service conveyor.



This photo shows method of unloading cover coat from overhead milled enamel storage tanks through centrifugal sieve and magnetic separator into 60-gallon pressure tank. In the background is one of the porcelain enameled storage containers used for ground coat. Mill unloading equipment is at lower left.

necessity for banking parts in process. This also gives plenty of space for inspection, and any ground coat repairs are handled on this conveyor line feeding the cover coat spray.

Pressurized spray room in two sections

Cover coat is sprayed in a 26' pressurized and filtered air spray room, and into a water wash booth. The spray room is composed of two sections. The first section, 20' in length, is for regular white, and the second 6' section for acid resisting. The partition between the two serves to isolate acid resisting enamel from the regular reclaim.

Spray weight is approximately 35 grams per square foot for zirconium enamel. The titanium base acid re-

sisting enamel is applied at about 20 grams per square foot for bottoms only. Conveyor hangers are on 4' centers, and the conveyor runs approximately 16' per minute.

Dip room for crisper pans

The cover coat spray conveyor continues through an adjoining "dip" room, also pressurized, where cover coat is applied to crisper pans. The air from this room comes from the main spray booth supply. Merry-go-round type dipping machines are employed, and especially designed hooks used for dipping the pans are also used as burning hooks. There are three of these merry-go-round units, one each for three dip tanks, to keep up with the conveyor line.

The cover coat chain then contin-

ues through a three-pass drier identical to the one described for ground coat.

Upon leaving the cover coat drier, the conveyor continues into an especially designed pressurized brushing room approximately 18' x 27'. All large parts are brushed on the conveyor, with high speed, air-driven brushes. A parallel motor-driven belt conveyor, sponge rubber covered, is used for small parts such as crispers, evaporator doors, crisper fronts, etc. A high velocity air exhaust takes all brushing dust away at conveyor level. All dust from the room is exhausted through water wash dust collectors to the outside.

As the finish coat system conveyor leaves the brushing room, it feeds directly to the furnace chain. It may be of interest to know that the conveyor only travels about 20' or 30' after ware is transferred to the furnace chain until it is again loaded with fired ground coat ware for the return trip.

Furnace capacity is such that both the ground coat and cover coat systems can feed the furnace chain simultaneously. As the fired cover coat leaves the continuous furnace, it travels for considerable distance parallel to the main plant service conveyor. At this point final inspection is made, and the OK'd ware transferred immediately to the service conveyor which carries finished parts to the assembly room.

In and out in 1 hour 45 minutes

One hundred and sixty food compartment linings can be porcelain enameled in both ground coat and cover coat in the Philco plant per hour. The plant is synchronized so that a raw steel food compartment entering the enameling department on the service conveyor from fabrication can be cleaned, enameled, inspected and back on the service conveyor on its way to assembly in one hour and forty-five minutes.

PLANT MEN — don't forget to make your reservations for the Porcelain Enamel Institute Forum to be held at Ohio State University, Columbus, Ohio, on September 10, 11 and 12.



METALWASH Equipment For Spray Pickling Prior to Porcelain Enameling

The METALWASH Spray Pickling Machine pictured above, in operation in the new plant of one of the leading refrigerator manufacturers, is a great step forward in pickling procedure in the porcelain enamel industry.

METALWASH Machines have revolutionized cleaning and pickling of metal surfaces prior to porcelain enameling. Operation is continuous through washing, rinsing, pickling, neutralizing and drying — all in one unit, compact and complete. This process produces a cleanly pickled surface — greatly increased adherence qualities — the optimum in working conditions. Some manufacturers using these machines report as much as 50 per cent increased production, with even finer enamel finish.

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The nature of enamel adherence

a detailed analysis of various theories

By Professor R. M. King • ASSOCIATE EDITOR



The nature of adherence of cobalt-bearing enamels to the conventional enameling stock has received considerable attention

from many investigators during the past several years. Since this subject persistently arises in our discussions, it is the purpose of this article to present to *finish* readers a comprehensive resumé of facts and theories.

General theory of adherence

Cohesion or coherence is usually defined as the attraction of like particles and adhesion or adherence as the attraction of unlike particles. Fundamentally, no difference exists between these attractive forces, since both are electrical in nature. We sometimes get the impression that coherence is always greater than adherence in a given situation, but this is not necessarily true. A welded joint may be stronger than the metal itself, and glue-wood joints may break in the wood rather than in the glue film. If the proper wood is joined to a ground coat surface with the proper glue and if it is then dried and the joint placed in tension, the ground coat will rupture rather than the glue; and, more importantly, the ground coat will rupture rather than the bond between ground coat and the metal. Soldered joints have been obtained between the ends of copper rods with a strength two and one-half times the strength of a rod of solder of the same diameter. All such adherence phenomena are usually classified under the term wetting, which is the result of surface forces internal-

ly uncompensated in both the adhesive and the material to which it is joined.

Modern knowledge of the structure of glass reveals the fact that with the addition of certain ions, such as those of cobalt, nickel, iron, aluminum and zinc, the alkali and alkali earth metals release oxygen bonds from ions like silicon, boron, and others, thus making attractive forces available to react with still other ions or atoms in non-metallic and metallic surfaces. The adhering properties imparted to enamels containing cobalt and nickel have been partly attributed to these bonds, but ions other than those of cobalt and nickel also have this property and yet do not bring about a similar degree of adherence. These bonds may be responsible for the wetting of the metal by the enamel and probably account for adherence when ions with such specific actions as those of cobalt and nickel are not present. Future research should give further attention to the implications of these facts and theories.

It is evident that a fundamental attraction exists between unlike particles of matter as well as like particles of matter, a fact which is not complicated by the introduction of an intermediate layer. Nevertheless the presence of such a layer as a necessary condition of adherence has dominated thinking in regard to the adherence of enamels to metals. This probably arises from at least two facts: (1) Glue, solder, and many other adhesives are employed as adhesive films in many joints. (2) Metals and oxides are known to precipitate at some enamel-metal interfaces, particularly that of the con-

ventional ground coat and enameling stock.

Glues, cements, and solders are necessary for some joints because even the most highly polished surfaces cannot be brought into contact closely enough to allow the attractive forces of the residual bonds on the surface to come into play. Furthermore, exposed surfaces become contaminated with impurities, including air, which influence the force of attraction between surfaces. It is possible, however, to obtain marked adherence between highly polished surfaces by forcing them together in the proper manner. It should be kept in mind that films of glues, cements, and solders may be applied successfully to a single surface without an intermediate layer. This is analogous to a film of enamel on a metal surface.

It also should be kept in mind that the mere *presence* of a precipitated material of any kind at an interface is not *proof* that it is a cause of adherence. It may be a cause, a deterrent, or it may be simply extraneous material. In the preparation of metal for soldering or even for enameling every effort is made to clean the surfaces and to remove all possible intervening material because it is believed that clean metal is essential to adherence.

Glass-to-metal seals

The following quotations from a recent article by Monack on glass-to-metal seals are of interest in this connection: "It is often taken for granted that the presence of an oxide coating on a metal is essential for wetting of that metal by the glass. It has further been assumed that the

presence of an intermediate oxide layer between metal and glass is necessary to obtain glass-to-metal adherence."

After citing several instances of good seals directly to the metal he says:

"There is ample evidence, therefore, that the presence of oxide is not a requisite condition for a successful seal.

"Another usually accepted opinion is one that postulates a 'graded' seal between metal and glass, which

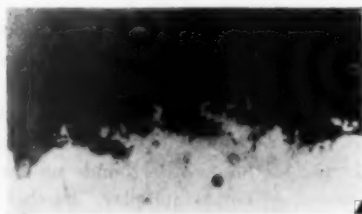


FIGURE 1—Metal dendrites projecting into a ground coat.

gradually merge into one another through the medium of an oxide layer, soluble in both metal and glass. Since seals can be made to clean metals, it is obvious that the 'graded seal' theory is not a necessary explanation. It is true that most oxides are readily soluble in glass. It is true that metal oxides dissolve in metals. By proper manipulation of time, temperature, partial pressure of oxygen, etc., it is possible to obtain a 'graded seal' of mutually soluble type. Nevertheless, it can be said with certainty that in many seals there is little solution of the oxide in the glass.—Hence, while there is no doubt some penetration of oxide into the glass or solution of oxide into the metal, the conception of a 'graded seal' consisting of metal: oxide in metal: oxide: oxide in glass: glass is too ideal.

"It can be said with certainty, however, that glass will wet an oxidized metal surface more readily than it will a clean metal surface. This may be considered solution of the oxide in the glass, but it actually is more correct to call it penetration.

"Because of the very definite indications that glasses will wet and bond to both a clean metal surface

and an oxidized metal surface, it is necessary to assume that two types of action take place in sealing (unless it be agreed that even a clean metal surface is covered with an invisible oxide coating). On the other hand, if it is assumed that a metal oxide is merely a metal ion combined with an oxygen ion while a metal consists purely of metal ions, then the explanation of adherence need involve only a metal ion."

The "oxide" theory

One is not surprised to find that one of the most popular theories of enamel-metal adherence involves an oxide layer. This theory postulates a layer approximating the composition of ferrous oxide, usually called the ferrous phase, about three one hundred thousandths of an inch thick which dissolves in both the glass and the ferrous base thus aiding in the production of a "graded" seal.

The process by which this layer is reported to form is essentially as follows: By the time 1400° F. is reached in the firing process, all Fe_3O_4 , Fe, and ferrous phase formed on heating has been dissolved. At this point oxygen of the air begins to diffuse through the molten enamel and the iron base begins to oxidize slowly. Particles detached from the iron are oxidized to the ferrous phase which in turn is dissolved by the enamel. Equilibrium is never attained, and when the fired piece is cooled a film of the ferrous phase is attached by means of a solution bond to the glass and by means of solution bond to the iron.

Many weaknesses have been found in this mechanism.

1. It is rather restrictive, delicately balanced, and complex. It is doubtful that a layer of oxide of the order of three one hundred thousandths of an inch thick can be reasonably controlled in commercial enameling. The thickness specified for the layer is only 0.006 of the ground coat layer itself. One might ask: How can a layer of the ferrous phase unmixed with enamel be formed after the molten enamel once has been in complete contact with the metal? What

would happen to this layer during subsequent firings of one or more cover coats when the diffusing of oxygen is prevented or at least diminished?

2. The sequence of the chemical reactions proposed is of doubtful accuracy. For example, if the enamel has dissolved all the scale formed during the premelting stage, it would seem that the oxygen diffusing through the enamel would first oxidize the dissolved ferrous phase as well as the iron particles before it reaches the iron base. If this happens, both the ferrous phase and magnetic iron oxide should be found in the enamel when cooled after the normal firing period. That only a layer of the ferrous phase is present under these conditions is the claim of the proponents of this theory.

3. The ferrous phase is soluble in the ground coat. This is admitted by the supporters of this theory as well as those who do not support it. Evidence is available which indicates that the saturation limit is not reached in the normal firing of ground coats. The crystallization of a substance from a medium not sat-

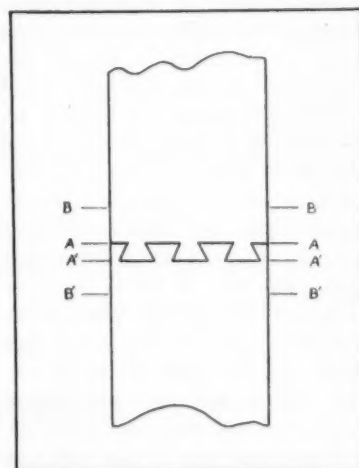


FIGURE 2—A conventional dovetail joint.

urated with respect to the substance must, therefore, be explained. Sugar or salt will not crystallize from unsaturated water solutions.

4. The ferrous phase does not exist at ordinary temperatures except in an unstable state. Many investi-

gators agree that the ferrous phase is stable only above 573° C. On cooling it begins to break down at this temperature, forming Fe_3O_4 and free iron. It reaches its maximum rate of decomposition at about 250° C. Only a portion of any of the ferrous phase existing at high temperatures is available at room temperatures and that in such an unstable condition it too should decompose upon refiring or even upon heating to about 200-250° C. This might take place in an oven, in which case the ground coat would detach itself from the metal if the ferrous phase were the only medium causing adherence. No evidence is available which indicates that ground coats do not adhere to oven walls when heated repeatedly to 250° C.

5. The ferrous phase is difficult to detect. The best instruments for identifying a crystalline phase are the petrographic microscope and the X-ray. Samples of ground coat broken from the metal have been carefully prepared and concentrated for X-ray diffraction. A single faint line was found which could be attributed to either a metastable ferrous phase or to cobalt oxide. But this line was found in ground coats that had no adherence as well as those that had good adherence.

In view of the above, it is difficult to conceive how a thin layer of brittle, soluble, unstable crystalline material can be a better medium of adherence than an amorphous, gluey substance such as glass.

The "dendrite" theory

This theory is another involving an intervening medium, namely a series of tenacle-like precipitates of iron, cobalt, and nickel. These tenacles seem to attach themselves to the iron and extend into the enamel just as metal reinforcing rods extend from a concrete foundation into a wall or a column. (See Figure 1.) It has been shown by the most reliable instruments available, the microscope and the X-ray, that iron, nickel and cobalt do precipitate at the enamel-iron interface from ground coats containing oxides of cobalt and nickel. Strangely enough iron

seems to predominate when the usual amounts of nickel and cobalt oxides are present.

That the metal dendrites do attach themselves to the metal base can be shown by a simple experiment: Make a "sandwich" of two pieces of enameling stock and a layer of ground coat of the usual thickness. Attach heat resisting wires to each

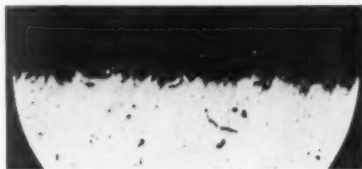


FIGURE 3—Rough contact line between iron and ground coat containing no cobalt or nickel oxides.

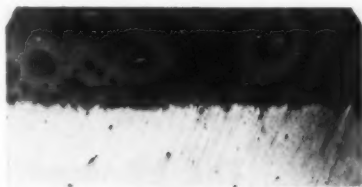


FIGURE 4—Smoother contact line between iron and ground coat containing 1.25% cobalt oxide.



FIGURE 5—Still smoother contact line between iron and ground coat containing 2.50% cobalt oxide.

plate and connect the wires to a 110 volt alternating current line and provide a means for measuring the electrical resistance of the "sandwich." When the "sandwich" assembly is fired one to three times, depending upon the ratio and amount of cobalt and nickel oxides and the thickness of the enamel, the resistance, which may be high at first, will drop on cooling. Metal precipitation may develop to a point at which the resistance will drop to that of a continuous metal circuit. If the enamel layer contains no cobalt or nickel oxides, metal precipitation will not take place, and the resistance will be of an extremely high order on cooling.

The ferrous phase

Chemists and metallurgists have studied the reactions of the ferrous phase and mixtures of the ferrous phase with cobalt and nickel oxides at high temperatures. As mentioned above, the ferrous phase begins to decompose on cooling at about 573° C. If a small amount of cobalt oxide is added, it decomposes at a higher temperature, precipitating cobalt and Fe_3O_4 ; and as it cools to 573° C., iron begins to precipitate. If a small amount of nickel oxide is added the initial decomposition temperature is still higher. With both oxides the decomposition temperature increases as the concentration of the oxides increases until a maximum is reached.

Many experiments with ground coats similar to the one just described confirm the fact that metal precipitates on cooling and at least partially disappears on heating and that the rate and amount of precipitation depend upon the amount and ratio of the cobalt and nickel oxides. Thus we find that reactions at the enamel-iron interface are at least qualitatively similar to the reactions of mixtures of the oxides themselves. These reactions, and the fact that the microscope and the X-ray show unmistakably the presence of precipitated iron, nickel, and cobalt, indicate that, rather than remaining or precipitating as solid or dissolved phases of divalent oxides, they actually tend to decompose and precipitate metals and oxides of the Fe_3O_4 type.

The dendrite theory has the weakness of the oxide theory in that it assumes an intermediate layer and the weakness of the etched-surface theory described later in that it suggests a highly rough surface. A difference exists, however, in that the dendrites produce long projecting tenacles which grow on each firing, rather than a relatively smooth surface of iron oxide or rolled metal.

It appears that scientific proof of the dendrite theory has been carried a step farther than that of the ferrous phase. It has been shown that metallic dendrites are present when adherence is good and absent where

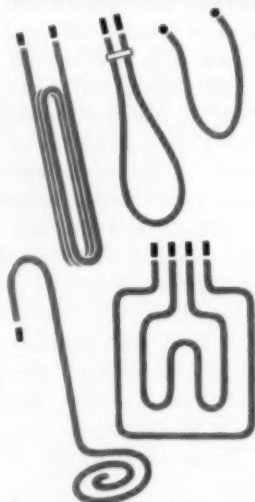
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Machine tool congress

Charles F. Kettering, research consultant for General Motors Corporation; James F. Lincoln, industrialist; and Fulton Lewis, Jr., news commentator, are among the 13 speakers who will address sessions of the Machine Tool Congress to be held concurrently with the 1947 Machine Tool Show in Chicago, September 17 to 26, it has been announced.

American Gas Association 1947 Convention in Cleveland

The committee in charge of general arrangements and the programs for the general sessions of the 29th Annual Convention of the American Gas Association in Cleveland, October 6, 7 and 8, 1947, held a meeting at Association headquarters on July 2.

Recently appointed by President R. H. Hargrove, the committee consists of Chairman J. French Robison, president, The East Ohio Gas Company; R. J. Canniff, advertising and sales promotion manager, Servel, Inc.; O. R. Doerr, general sales manager, Pacific Gas & Electric Company; B. T. Franck, vice president, Milwaukee Gas Light Company; L. C. Harvey, president, The Bryant Heater Company; W. H. Ligon, president, Nashville Gas & Heating Company; D. E. Maloney, agent, The East Ohio Gas Company; Irving K. Peck, vice president, Manufacturers Light & Heat Company; J. J. Quinn, vice president, Boston Consolidated Gas Company; E. F.

Schmidt, vice president, Lone Star Gas Company; A. H. Stack, president, The Tampa Gas Company, and Secretary Kurwin R. Boyes, A. G. A. Headquarters.

A visitor from Sydney



finishfoto

J. H. Dean, director of Malloys Ltd., Sydney, Australia, was a recent visitor at the *finish* offices.

Malloys Ltd. operates a one box-furnace porcelain enameling plant for the production of parts for refrigerators, ice chests, and for steel sinks and basins. The furnace is a 6 x 12, 250 kw electric. The company operates as sheet metal workers, ventilation engineers and producers of builders and plumbers supplies.

Both Mr. Dean and Co-Director N. C. Malley are currently spending three months in the States. They flew to San Francisco, and will cover

several of our principal cities while here.

Plans are being laid for a complete new plant which will include a new porcelain enameling department with a continuous furnace and all new, modern equipment.

Eastern enamelers first fall meeting

The first fall meeting of the Eastern Enamelers Club will be held on Saturday, September 20, at the Ritz-Carlton Hotel in Philadelphia.

DeVilbiss spray finishing school

Intensive training at the DeVilbiss Spray Finishing School, in Toledo, Ohio, is still available without charge to industrial finishers operating DeVilbiss spray equipment.

Courses of one-week duration will take up on October 6 and December 1. All interested persons should write well in advance for registration, the company suggests.

Fire ruins government-owned plant at Ferro Enamel Corp.

A government-owned chemical plant at the Ferro Enamel Corp., Cleveland, Ohio, was completely destroyed by fire recently. The building was built in 1943, at a cost of \$350,000.

Ferro Enamel used the building as a nickel processing plant during the war but discontinued operations soon after V-J day. Most of the machinery had been removed, having been sold to the Harshaw Chemical Co. by WAA, but about \$50,000 worth of equipment and machinery still stored there was wrecked.

According to a Ferro executive, there was no damage to manufacturing facilities related to peace-time operations of the company.

International lighting exposition to feature planned lighting

The importance of Planned Lighting for industry, business, airports, stores, etc. will be the principal subject of the Second International Lighting Exposition and Conference

to be held in Chicago at the Stevens hotel, November 3 to 7.

Through a series of five morning conferences, the Exposition Committee will seek to make better known the practical applications of the newest developments in illumination and the importance of the Exposition's theme, Plan Tomorrow's Lighting Today.

Tickets to the Conference are available to architects, electrical contractors, wholesalers, industrial execu-

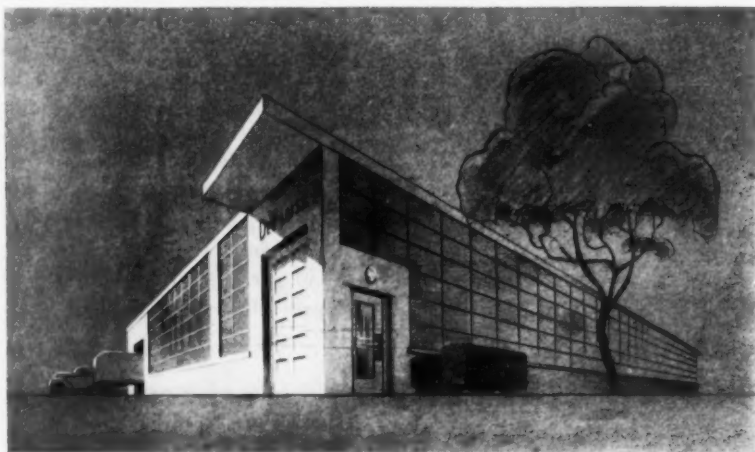
tives, illumination engineers, school men, business men, public officials, utility personnel, railroad officials, oil company executives and other industrial and commercial officials concerned with lighting.

The conference program topics include: Trends and Progress in Lighting; Industry Plans for Lighting Promotion; How the Electrical Wholesaler Can Increase His Lighting Sales; and The Electrical Contractor—the Key Man in the Lighting Plan.

manager for the Brown division of Minneapolis-Honeywell Regulator Company.

They are as follows: Edgar Andrews, Atlanta; Nilsson S. Bassett, Boston; R. J. Bierman and Clarence W. Swanson, Minneapolis; Edward J. Bryne, Houston; Warren H. Erf-tenbeck, Buffalo; David J. Fair, Dallas; William R. Hamaker, Detroit; Charles F. Hintz, Chicago; Lawrence W. King, New York; Donald W. Larcen, Milwaukee; John F. Smith, Tulsa; and Andrew H. Albee, Cleveland.

DeVilbiss to build new Canadian plant



The DeVilbiss Company will soon break ground for the first unit of its new Canadian plant intended to better supply the heavy demand for spray booths throughout the Dominion, according to a recent report.

The new structure will be devoted

to the manufacture of spray finishing exhaust systems and will enable the production of new spray booth developments. Operations in the new unit will augment the present Windsor plant production of spray guns, air compressors and atomizers.

New Magic Chef plant in production

Magic Chef heavy duty gas cooking equipment began rolling from assembly lines in the new American Stove Company plant, in Cleveland, July 16, according to Stanley E. Little, vice president in charge of sales for the company.

The new plant, a former war production facility, is designed and equipped to produce at a rate of between two and three times that of prewar production schedules. It was purchased and equipped with new machinery at a cost of considerably more than \$1,000,000. "This is just

one phase of American Stove Company's multi-million dollar postwar expansion program," said Little.

It is anticipated that by October the last moving will be completed and full production attained at the new headquarters, 3201 Harvard Avenue, according to A. W. Leeseberg, plant manager.

Brown names new sales engineers

The assignment of a new group of sales engineers to the branch and regional offices of the Brown Instrument Company has been announced by William H. Steinkamp, field sales

Titanium "trust" ruling

According to newspaper reports, the U. S. Supreme Court has upheld a U. S. District Court ruling that E. I. DuPont de Nemours & Co., Inc., National Lead Co., and Titan Co., Inc., have violated the Sherman Anti-Trust Act. Justice Burton delivered the Court's 4-3 decision.

The District Court held the firms had combined to restrain foreign and domestic trade in titanium compounds.

Foreign visitors invited to instrument conference

The international liaison committee of the Second Instrument Conference and Exhibit extended invitations to engineers of all countries to attend the conference and exhibit at the Stevens Hotel, in Chicago, September 8-12, 1947.

Arrangements will be made with the Stevens so that foreign visitors, arriving in Chicago before the conference and remaining for a short time after its termination, can have the use of their hotel rooms during the whole period of their stay, according to the committee.

Plumbing fixture shipments far above 1946 figures

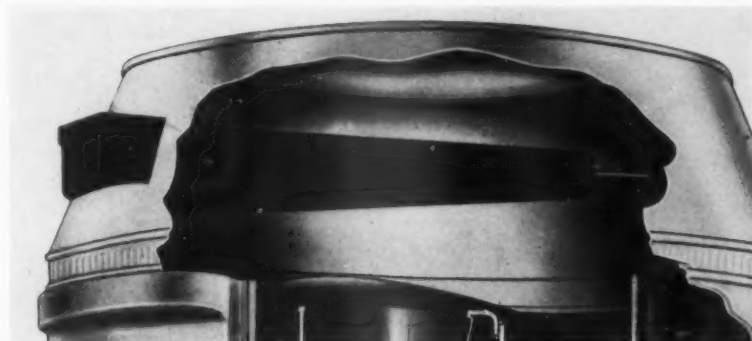
Dollar values of porcelain enameled plumbing fixtures shipped during the first quarter of 1947 showed an increase of 161% over first quarter shipments during 1946, according to the Porcelain Enamel Institute.

The \$26,900,000 total shipped represents an increase of \$473,000 over shipments during the last quarter of

1946. Cast iron fixtures, which represent 66% of the total, increased \$2,000,000 over the total for the last quarter of 1946. This increase was balanced somewhat by a decrease of \$1,800,000 in steel plumbing fixtures which reflects the tight steel supply.

Kitchen sinks and lavatories showed the largest unit shipment totals in this year's first quarter. The total number of porcelain enameled lavatories shipped increased 20%, or 55 thousand units, over fourth quarter 1946 shipments.

New furnace uses porcelain enameled humidifier



A new coal furnace, introduced to "round out the company's line of domestic heating equipment," was announced by C. S. Davis, Jr., vice president and general manager of Norge-Heat division, Borg-Warner.

The furnaces, available in 3 sizes, are designed for ready conversion to oil, or adaption to stoker-feed operation. *The humidifier is of porcelain enamel, and is located in the furnace casing hood.*

The war is over

More selective consumer buying has effected a healthier condition for electric appliance dealers than has existed at any time in the past seven years, according to Howard J. Scaife, manager of sales development for Hotpoint, Inc.

Addressing a panel of business editors in Chicago on July 15, Scaife said, "Consumers are no longer willing to buy the first appliance offered, merely for the sake of immediate delivery. More and more dealers," he continued, "report that their customers are demanding dependability and other assurances of quality that accompanied first line appliances prior to the war."

Manufacturers offered technical assistance

The American Gas Association has employed a trained gas utilization engineer to provide technical assistance to manufacturers in an effort to improve their equipment. Particular attention will be directed

toward counter-type commercial cooking appliances.

Edgar A. Jahn, who joined the Association recently, is now available to assist appliance manufacturers to comply with American Stan-

PEI offers new advertising emblem

The immediate availability of a new advertising emblem for use in properly identifying porcelain enameled products in manufacturers' and retailers' advertisements has been announced by the Porcelain Enamel Institute. (*See emblem on editorial page of this issue — page 11.*)

Newspaper mats, in a number of suitable sizes, or reproduction proofs of the emblem, for either one or two color reproduction, are being offered without cost to all companies who advertise genuine porcelain enamel finished products or merchandise.

Origination of this emblem grew out of an advertising survey recently completed by the Institute's Market Development Committee in which advertisements of over 7000 manufac-

turers and retailers of porcelain enameled products or merchandise were viewed. In this survey a great discrepancy in terminology and description of porcelain enamel was found in the efforts of the advertisers to describe this deluxe finish. However, evidence was strong that the selling value of porcelain enamel finishes, especially on appliances, was highly regarded as a major sales point by alert merchants and manufacturers.

The offer to provide suitable reproduction copy of this "Genuine Porcelain Enamel" emblem has been opened to all manufacturers of products on which the major part of the finish is porcelain enamel, all wholesalers or distributors of porcelain

Sound motion picture explains r. f. heating

Principles and applications of radio frequency heating in industry are explained in a new 16 mm sound motion picture filmed by Westinghouse. The two-part movie is about 40 minutes long. The first part explains the theory of induction heating, and the theory of dielectric heating is explained in the second section.

The film is available without charge from the Film Section, Westinghouse Electric Corporation, 511 Wood Street, Box 868, Pittsburgh 30, Pa.

Directors of The Youngstown Sheet and Tube Company have declared a quarterly dividend of \$1 per share payable September 15 to stockholders of record August 15.

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In Complete Conformance to Customer Demands

From an initial test or experimental order to carload lots, Pemco material will perform in complete accordance to customer demands, for the enameling plant production manager or the final purchaser. Never has such workability, economy and uniformity been attained in a finish except by use of continuous smelted frit by Pemco. By this exclusive process, protected by U. S. Patents,* production of frit of unusual uniformity is obtained day after day. Today ground coats and cover coats, smelted in a never ending stream are THE accepted finish in the porcelain enameling industry, regardless of time or place or weather.

"Batches" are obsolete!

We cordially invite you to visit Pemco. See for yourself the six continuous smelters in operation. We invite you to visit our laboratories. Talk with the men whose sole job is to find ways and means to lighten your burdens. Then, YOU will appreciate the "bigness" of Pemco and why Pemco Frits, Colors and Components are accepted as the basis for comparisons in the industry. You will always be welcome.

*The following patent rights, owned by Pemco are registered in the U. S. Patent office. 2. 323.930—2. 262.029—2. 262.070—2. 248.877 2. 137.931—2. 137.930

PEMCO CORPORATION

BALTIMORE 24

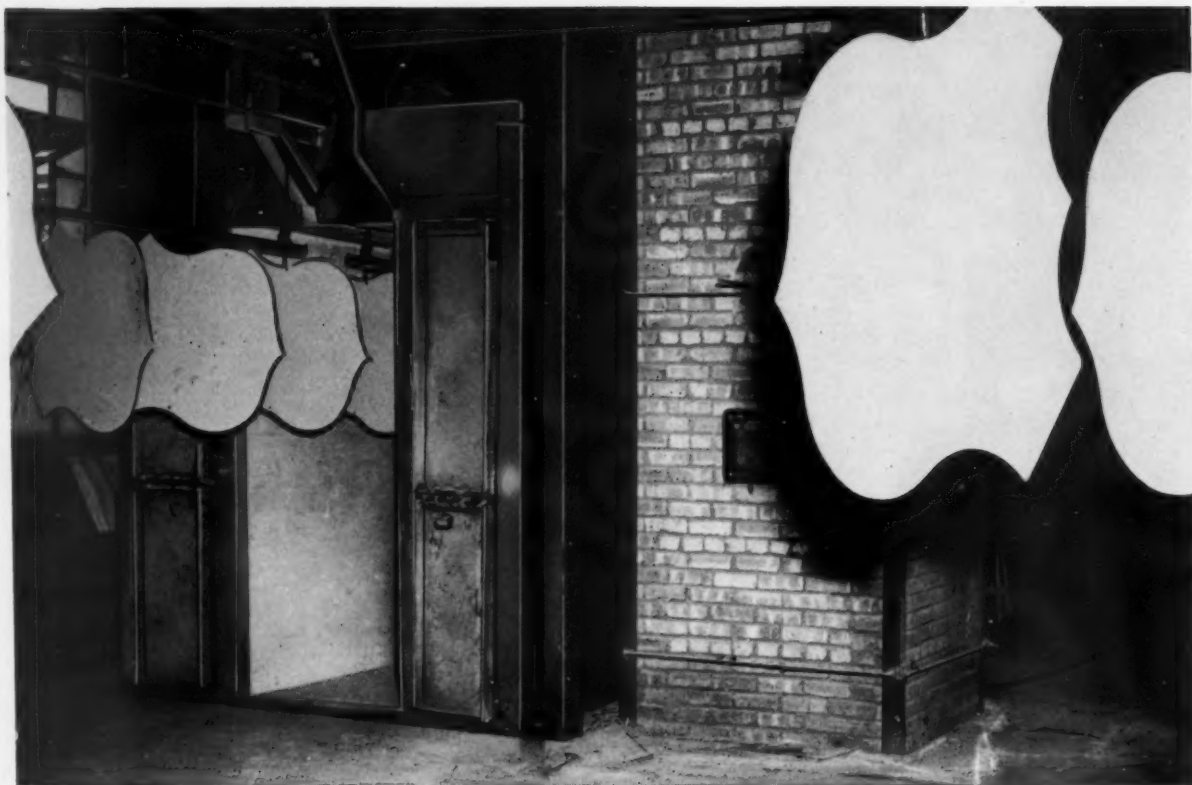


MARYLAND

"ALWAYS BEGIN WITH A GOOD FINISH"



Day and Night Without End!



A new Boland continuous furnace at General Porcelain Enameling & Manufacturing Co., Chicago, Illinois

Still another **BOLAND Single Flow Furnace** is producing better ware — —

To produce brilliant attention-getting signs in many colors — colors that are uniform from load to load — requires temperature control. In a Boland **SINGLE FLOW** continuous furnace you get even heating on both sides of the ware and positive temperature control.

Not only for signs but for ranges, refrigerators, heaters, table tops, sinks or any other fabricated product, the controlled heat of the Boland firing zone means better quality ware, free of distortion.

You certainly want these features in your next continuous furnace, and in addition you will want to know that your furnace is built to stand up, day in and day out, year in and year out. One feature you will want, to insure this durability, is the Boland patented **FLOATING ROOF**.

It costs you nothing to discuss your furnace problems with Boland, and it may pay big dividends in economical operation and better quality ware.

ALBERT J. BOLAND COMPANY

407 NORTH EIGHTH BUILDING • ST. LOUIS 1, MO.

Designers and Builders of Continuous and Box Type Enameling Furnaces

A visit to the first

store modernization show

By H. B. Richardson

GATHERED recently for a week at New York's Grand Central Palace were many of the country's foremost students and practitioners of the merchandising arts. They were there to discuss and to listen to discussions, and to view exhibits pertaining to "changing inventory to bank account." The occasion was the first show of its kind—it was called the Store Modernization Show—and in the expressed opinion of some of the exhibitors it was a worthwhile, profitable and educational undertaking.

Lights and lighting

Looming large in the displays were lights and lighting. Leading the way, General Electric, with a group of 19 fixture manufacturers, showed a wide range of the newest, best and most modern lighting effects and arrangements. Probably in no other respect has the change been so rapid and all-embracing as it has been from the old oil and gas lighting of by-gone days to modern "Daylight" as used so effectively in present-day stores.

Modern design display cases, beautiful in type and finish, and planned to show goods conveniently arranged for examination, attracted favorable attention. Air conditioning equipment, fixtures for apparel, furnishings, and even carpets were much in evidence.

All emphasis was on selling—in direct contrast to conditions only a few short months ago. Industries long identified with one field are now going into new ones. For example, Reynolds Metals Company, Building Products Division, is offering aluminum corrugated roofing and siding and, most interesting, a cleverly designed shingle of aluminum which lends itself to quick and easy application. Much of the product was in familiar natural aluminum finish, but some was in bright,

attractive colors.

The Marble Institute of America, which presumably is in the position of comparative security in its share of the market, had a display and apparently was making an aggressive bid to maintain or improve its position.

The United States Plywood Corporation, with elaborate space and displays, presented a number of trade marked products of wood, and wood and plastics in combination, all of which were attractive in appearance.

Where was porcelain enamel?

Among all of those things which either compete with porcelain enamel or could be replaced with porcelain enamel, one was likely to ask—"Where was porcelain enamel?" There was some, but it was strictly an individual effort and not the industry-wide activity which the occasion would seem to have required.

Seaporcel Porcelain Metals, Inc., Long Island, N.Y., with a display on which thought, effort and expense had been lavished, was the only porcelain enamel manufacturer, as such, that was represented. Leonard R. Nachman, in charge, reported he was well pleased with results. His roster of visitors, all interested and prospective buyers, showed callers from a dozen states and some extremely interested ones from Canada.

New and unusual finishes in porcelain enamel were shown, including "terra cotta" and "granite" in matte and gloss finishes. A number of die-made pieces attracted the notice of dozens of prospective buyers. This was one of the busiest booths at the show, and it appeared that the expense would be written off during the first half-day.

McCray Refrigerator Company, Kendallville, Indiana, had a large and imposing exhibit with Mr. Culbertson, metropolitan representative, in charge. A new model of 60 cu. ft.

capacity, with a one-piece porcelain enamel interior, attracted close attention. A steady stream of visitors kept this place busily occupied.

All commercial refrigerator interiors appeared to be uniformly porcelain enameled. Exteriors in many cases were synthetic, probably because of the difficulty in obtaining suitable enameling iron. In consequence of this condition, porcelain enamel is being used only where it is a matter of absolute necessity.

Four points to consider

A thoughtful review of the show emphasizes a number of things.

First, the "party" is over. Intelligent, aggressive, well-directed and resourceful selling is the order of the day.

Second, those concerns and industries which have permitted sales forces and activities to deteriorate are in doubtful position.

Competition is accelerating between industries as well as between units of manufacture in the same industry. This will increase as more productive capacity emerges.

Third, it would seem to be important to organize industry-wide activities and promotion. Individual companies, unless extremely dominant in the industry, will be unable to hold place against new-comer, war-born industrial giants bent on seizing and holding newly won volume and markets.

Fourth, frequent reference was made in papers and in discussions at the Show to Retail Stores as being "Sales Factories," "Machines for Selling," etc. The thought appears to be that mass production must require mass selling. And this selling must be streamlined for ease and speed. Of course there always will be production problems—they never will end—but again the pendulum has swung. Once more the Sales Department must carry the ball.

Porcelain enamel institute forum

ninth annual forum for plant men to be held at Ohio State University

THE annual Porcelain Enamel Institute Forum for plant men, which alternates between Ohio State and Illinois universities, is scheduled this year for September 10, 11 and 12, at Ohio State University, Columbus, Ohio. The following covers general information for participation and the complete program as announced by the Institute office in Washington.

FORUM INFORMATION

Participation in the Forum is open to all individuals connected with or interested in the Porcelain Enameling industry.

All sessions will be held in Campbell Hall, on the south side of the Ohio State University campus.

Registration of all persons attending the Forum will be conducted at Campbell Hall. There will be a registration fee of \$10.00 for the three-day session; \$7.50 for two days; and \$5.00 for one day, with the exception of students and faculty. Proceeds from the registration will be used to help defray the Forum's expense and to publish proceedings of the Forum.

The banquet will be held Thursday evening, September 11, at 7:00 p.m., at the Deshler-Wallick Hotel.

The Executive Committee of the Porcelain Enamel Institute has ruled there are to be no forms of commercialism and absolutely no company entertainment.

THE PROGRAM

Wednesday Morning, September 10

- 9:00 a.m. Registration
Visit to Department of Ceramic Engineering
- 10:30 a.m. Meeting of Committees
(Includes Meeting of Coordinating Committee of Enamellers Clubs)

Wednesday Afternoon, September 10

- Presiding
R. M. King, Prof. Ceramic Engineering,
Ohio State University
- 1:30 p.m. Address of Welcome....Dean C. E. MacQuigg,
Ohio State University
Response.....Richard H. Turk, Pemco Corp.,
President, Porcelain Enamel
Institute
- 2:00 p.m. How to Choose the Correct Type of Porcelain
Enamel for Specific Applications...J. E. Hansen,
Ferro Enamel Corp.
Demonstration and Discussion of Apparatus for
Evaluation of Adherence.....A. C. Francisco,
P.E.I. Research Fellow,
National Bureau of Standards

Thursday Morning, September 11

- Presiding
F. A. Petersen, Special Research Associate,
Professor of Ceramic Engineering, University
of Illinois, Urbana, Illinois
- 9:30 a.m. Panel Discussion—"Different Systems of Metal
Surface Preparation."
Members of the Panel:
H. C. Ellinger, Philco Corporation—"Spray
Pickling."
A. M. Langbein, American Stove Co.—"Con-
ventional Pickle Practice."
A. R. Mallonn, Republic Stamping & Enameling
Co.—"Bright Annealing."
George Tuttle, Benjamin Electric Mfg. Co.—
"Spray Cleaning, Pickle, etc."

Thursday Afternoon, September 11

- Presiding
Frank E. Hodek, Jr., General Porcelain Enameling
and Manufacturing Co.
- 1:30 p.m. Fuel Oils.....William Jones,
The North American Mfg. Co.
Use of Liquefied Petroleum Gas...E. A. Jamison,
Phillips Petroleum Co.
Pyrometry and Its Application in Porcelain
Enameling Plants.....John Green,
The Brown Instrument Co.
Immersion Heating Application...S. E. Shepard,
The North American Mfg. Co.
- 7:00 p.m. Annual Forum Banquet
Speaker—Thurman (Dusty) Miller

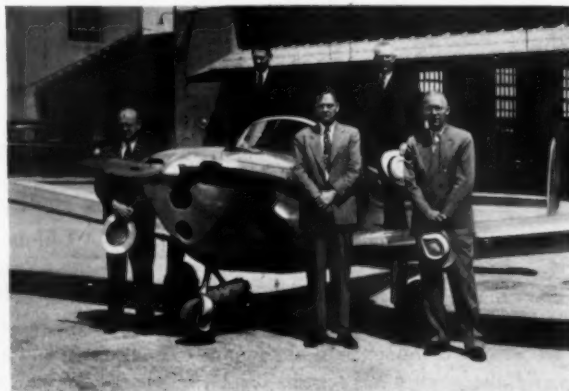
Friday Morning, September 12

- Presiding
J. B. Simons, Westinghouse Electric Corp.
- 9:30 a.m. Importance of Selection of Proper Personnel
.....Dr. Perry L. Rohrer,
Rohrer, Hibler & Replogle
Employee Training.....Edward Arter,
Curtiss-Wright Corp.

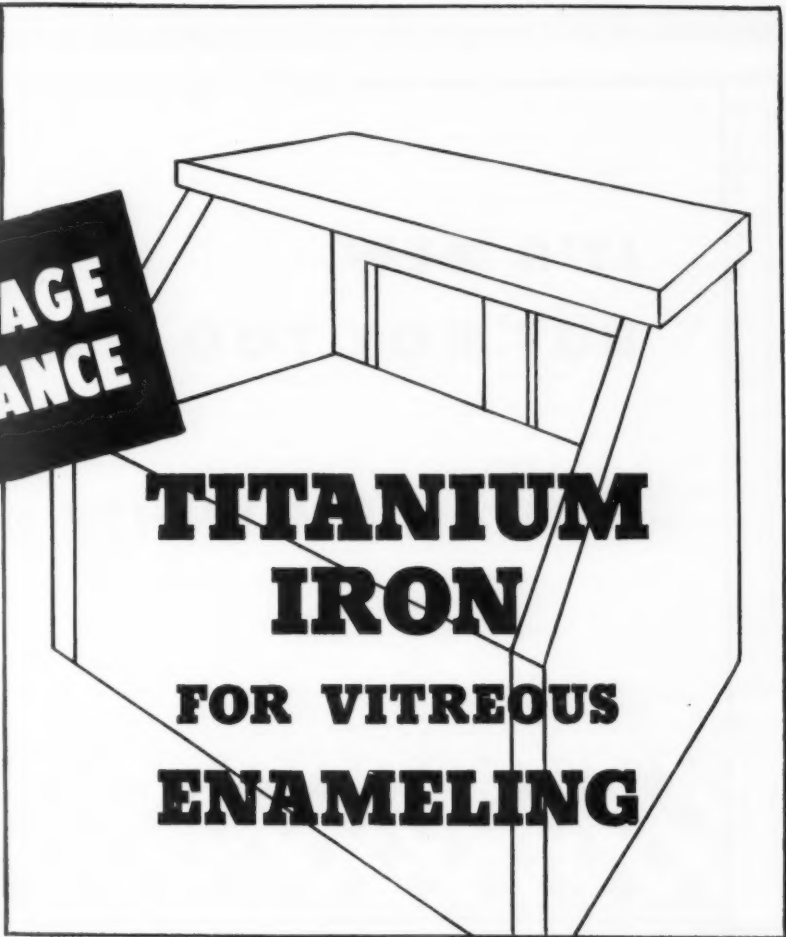
Friday Afternoon, September 12

- Presiding
F. H. Guthrie, Newark Stove Co.
- 1:30 p.m. Job Evaluation and Wage Incentives
.....J. M. Schappert,
National Metal Trades Association
Production Planning.....E. H. Smedley,
Stevenson, Jordan & Harrison, Inc.

Forum Committee members shown beside an Er-coupe owned by Professor A. I. Andrews after a July meeting on Forum plans. They are: Mackasek, Petersen, King, Andrews and Hansen.



**THINNER GAGE
SAG RESISTANCE**



**TITANIUM
IRON
FOR VITREOUS
ENAMELING**

ENAMELED WARE of lighter gage stock can be fabricated to desired shapes and retain a better appearance because of the increased sag resistance of Titanium iron for vitreous enameling. This particular feature is clearly demonstrated on chart at right.

Another feature is the elimination of formerly necessary ground coats. For—under proper shop conditions—the cover coat can be applied directly to the base metal. Also, these thin finishes reduce the hazards of chipping and breaking. Furthermore, at enameling heats, there is no sign of enamel boiling. During three years of both research and production experience, no case of fish scaling has been reported.

Further information is available upon request.

EFFECT OF GAGE AND COMPOSITION ON SAGGING RESISTANCE	
GAGE AND COMPOSITION	DEGREE OF SAG IN %
24 Ga. Standard Enameling Iron	100
24 Ga. Titanium Steel	57
18 Ga. Standard Enameling Iron	100
18 Ga. Titanium Steel	18

The Titanium Alloy Manufacturing Company produces the titanium alloy used in the manufacture of this steel. For samples of this steel, see your steel supplier. Pending patent applications on the new enameling process and products made thereby are owned jointly by Inland Steel Company, and The Titanium Alloy Manufacturing Company under trust agreement.



TITANIUM ALLOY MANUFACTURING COMPANY
Executive Offices: 111 Broadway, New York City General Offices and Works: Niagara Falls, N. Y.

**IT'S NEW
BUT NOT TOO NEW**

TITANIUM WHITE NO. 77

Yes, Century's Titanium White No. 77 is comparatively new to the porcelain enamel frit user, but it isn't new to the men who produce Century enamels or the men in whose plants No. 77 has been operating successfully for a period of months.

No. 77 has every advantage to be gained through the use of the new titanium type enamels — high opacity, acid resistance, surface hardness, plus a pleasing white color and good workability in the plant.

For well over six months No. 77 has been in daily production on all types of work such as stoves, washing machine tubs, commercial refrigerators, reflectors, steel sanitary ware and signs. Today we offer it to you as another of Century's time-proved frits.

For smooth plant operation and the production of the highest quality ware at lowest possible cost, we suggest Century time-proved ground coat and Century time-proved cover coat too.

If you haven't tried the new titanium white, phone or write for a trial of No. 77 right now!



CENTURY VITREOUS ENAMEL COMPANY, 6641-61 S. Narragansett Ave., Chicago 38, Ill.

The Washington round-up

By Wilfrid Redmond

TIN and antimony materials will continue to be under priority and allocation controls until March 1, 1948, as the result of legislation passed by the Congress and signed by the President. However, there are new provisions in this extension of the Second War Powers Act, which call for a more frequent review of the supply position of the two metals. Authority to administer the tin and antimony orders is vested in the Secretary of Commerce. The Secretary had this authority before but only by directive of the President. The Department of Commerce now has sole responsibility for the administration of the controls. The Senate has insisted and the President has signed a bill providing for quarterly reports by the Secretary of Commerce on allocation policy. Details are required on the supply position of tin and antimony and on the manner priority and allocation measures have been handled. The reports will be made both to the Congress and to the President.

The Senate receded from its position granting an extension of the controls over the metals until June 30, 1948, and accepted a compromise date of March 1. The House had passed a bill extending these controls under the Second War Powers Act to January 31, 1948.

The Office of Materials Distribution of the Department of Commerce has made no statement since the extension of the Second War Powers Act was approved, but officials of the Office told the committees considering the bill that if the controls were continued it would be possible to permit the same amount of tin and antimony materials to be used during the next years as at present.

Non-ferrous subsidies terminated

The President caused consternation in some segments of industry and among members of Congress from the non-ferrous metal producing states by vetoing a bill (H. R. 1602)

to extend the premium price plan for copper, lead, and zinc for two years. Subsidized production of lead, copper, and zinc, which was in effect for the past five years as a wartime measure, is now terminated.

The President, in a memorandum of disapproval, said that continuation of the subsidy program would contribute very little, if anything at all, to production of the metals now in shortest supply. The big producers in the copper, lead, and zinc industries, also took this view.

As far as the action concerns zinc oxides and lead materials, it is unlikely that there will be any substantial lessening of the supply.

The President pointed out that the market prices of copper and lead, the two scarcest of the metals, have been high enough in the last six months so that only a negligible share of the total output has been eligible for subsidy payments.

The total amount of market price and premium allowed for lead under the plan was 14¾ cents. The July 24 price for lead at New York was 15 cents per pound.

The premium plus market price permitted for zinc was 16½ cents per pound. The July 24 quotation for zinc was 10½ cents. The copper premium plus market price ceiling was 27 cents. The New York quotation July 24 was 21½ cents for copper.

At this price, lead, the scarcest metal, would not have been eligible for a premium July 24 although the scarcest of the three materials. Zinc, the one of the three in most ample supply would have been eligible for a premium of six cents a pound.

If it were to become law, the President said, the taxpayer would be primarily subsidizing zinc production, and the benefits to lead and copper production would be of minor significance.

The real weakness in the bill was that it did not provide any method of channeling metals to the security stockpile although its supporters gave

this as the main reason it should be passed.

It is probable, however, that there will be surplus copper and zinc soon for the national stockpile and within a year lead should also be available.

Steel distribution

The Senate Small Business Steel Subcommittee has announced that big steel producers will be called to Washington within two to three weeks for a conference which will deal with present distribution practices of the industry and recommendations for changes in these practices.

The Senate group has heard all the evidence and will now ask the steel industry to act on recommendations aimed at making more steel available to manufacturing industries.

The committee, in two months of hearings, has been unable to convince big steel leaders of the need for greater capacity to take care of the present abnormal demand which evidence indicates may continue for several years. The steel producers say there will be ample steel for everybody by the end of 1947. They have been saying this every six months since CPA controls were in effect.

Walter Ruether told the Subcommittee recently that steel companies were refusing to expand their capacity because, operating on planned scarcity, they could keep prices skyrocketing without running the risk of investment for expansion.

The Steel Subcommittee says also that the industry is exporting too much steel. But the chief complaint is the historical use pattern of distribution. Many manufacturers appeared before the committee who were unable to get steel because they were newcomers. They paid as high as \$260 a ton in the black market. Some of them reported they had been forced to close down, or soon would be.

When the big producers are called down to Washington they will be asked to follow recommendations for the correction of these distribution practices. Committee executives promise that if big steel does not take action on these suggestions a report will be made to the Congress asking for legislation to regulate steel distribution.

August meeting of Pacific Coast enamellers club

By Gilbert C. Close

WITH new officers at the helm, the Pacific Coast Enamellers Club began its second year of business meetings on August 8, at Scully's Cafe, in Los Angeles. Thirty-nine members were present. The meeting was called to order by new President M. E. Blackburn, of California Metal Enameling Co., and minutes of the previous meeting were read by new Secretary R. R. Sherrill, of Ferro Enamel Corp.

The first order of business covered the time and frequency of future club meetings. A motion was raised to limit meetings to three a year but a later motion suggesting monthly meetings, to be held the last Friday of each month, received almost unanimous approval.

A guest of the evening, Bill Brandt of the American Ceramic Society, then made a short talk inviting club members to participate in the forthcoming Pacific Coast Regional Meeting to be held October 16-17 in Los Angeles. Brandt stated that arrangements were already made for several papers on enameling, and invited club members to prepare others to be read at that time. Lively interest in the proposition resulted in a request that Brandt circularize all members at a later date to determine the exact number that could attend, and to make arrangements accordingly.

Metal cleaning discussed

The evening was highlighted by one of the best speeches delivered before the club to date. In this instance, the speaker was a club member himself, Roy W. Armour, of Chemical Process and Engineering Co. Roy's topic — metal cleaning — is close to every enameler's heart, and everyone present hung on his words.

Armour began his address by recalling that old axiom — "oil causes more trouble than anything in the plant." He continued by pointing out that the oily dirt encountered today are far more insidious in nature than

formerly, due to the wide variety of "off" steels the enameling industry is attempting to utilize in the absence of pure enameling stocks. Many of these steels were never intended for the enameling room; some of them, in fact, have been mill-processed for entirely different purposes.

The inclusion of mineral oils along with fatty and vegetable oils in the protective coatings on mill steel stocks has complicated the cleaning picture. The alkaline cleaners used in most enameling rooms are entirely inadequate when it comes to removing the mineral oil element. This is because mineral oil refuses to saponify, or otherwise become a soap in the presence of a caustic element.

In removing mineral oils, Armour continued, physical rather than chemical cleaning is necessary. The mineral oil element must be removed by a process best known as emulsification, wherein the individual mineral oil globules are surrounded by the soapy solution and held in suspension until they can be rinsed away. An emulsifying-solvent type of cleaner is best for this work, but such cleaners are far more expensive than conventional alkaline cleaning solutions.

Armour explained the use of both emulsifying-solvent cleaners and alkaline cleaners in automatic pickling installations. With this set-up, the emulsifying-solvent cleaners serves in effect, as a pre-cleaning bath to remove the most stubborn dirt, followed by a series of cleaning and pickling operations very similar to that followed in the conventional pickling room.

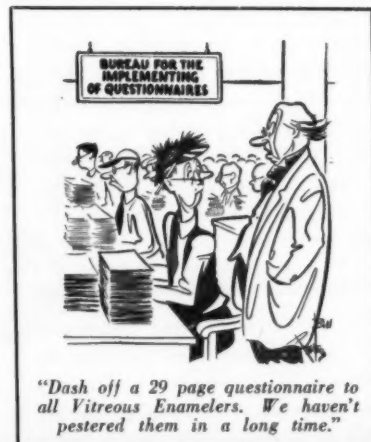
Insofar as costs are concerned, under certain conditions, emulsifying-solvent cleaning may result in a saving. This is when coatings of heavy mineral oil or grease may require excessive immersion times in an alkaline cleaner and result in rapid fouling of the solution. Furthermore, metal that is not thoroughly clean when sprayed will cause enough post-burn-

ing rejects to offset any saving realized from inferior cleaning methods.

Armour suggested a program to increase the efficiency of all pickling rooms under the present difficult situation:

1. Consider cleaning of ware before it becomes a production necessity.
2. Make certain that the various shops using cutting oils, forming lubricants, etc., use an oil that is easy to remove in an alkaline cleaner. Here, however, use of a favorable shop lubricant will not offset the disadvantage of steel already contaminated by a mineral lubricant.
3. Establish a standard pre-cleaning operation. This may be either an automatic washing machine, or an extra tank for an emulsifying-solvent type cleaner. This pre-cleaning operation will take pressure off the line tanks, and induce efficiency into the entire cleaning process. When and if an emulsifying-solvent type cleaner is employed, provisions should be made to apply the cleaner to the ware under pressure. This increases the physical cleaning action of the solution.
4. Tighten up on all pickling room controls; make certain that each and every function within the department is operating with the utmost obtainable efficiency.

Some discussion followed Armour's talk, and it was generally agreed that he had given a graphic and helpful picture of the entire cleaning set-up.



→ from Page 43

enameled products or appliances, and all retailers of this type of merchandise.

Copies of the Institute emblem or

advertising copy editing service can be obtained without cost by writing direct to the Porcelain Enamel Institute, 1010 Vermont Avenue, N. W., Washington 5, D. C.

Proof that porcelain enamel is durable



PHOTO COURTESY THE ENAMEL PRODUCTS COMPANY

Miss Patricia Varner prepares to apply the "blow torch test."

The accompanying photograph shows the "props" for an effective demonstration of the durability of porcelain enamel as presented by the Douglas Furniture Corporation. During the summer Furniture Market in Chicago, an effective demonstration on porcelain enameled table tops was presented in the company's display space. From left to right on the table the various tests are: (1) striking wood sulphur matches and allowing them to burn on the porcelain enamel surface, (2) applying alcohol torch, (3) citric acid tests—lime, lemon, etc., (4) gasoline blow torch, (5) a half dollar for coin test, (6) paring knife for scratch and cutting tests, (7) milk, alcohol, vinegar and iodine tests.

After ten days of continuous tests with intense heat, scratching, and the application of acids and other liquids normally found in the home, the porcelain enameled table top surface showed no effect whatsoever. Such a demonstration affords positive proof to furniture buyers of the unequalled durability of porcelain

enamel as a work surface.

Credit for the execution of the idea goes to Morton R. Cohen, of Douglas, who is said to be an enthusiastic supporter of porcelain enameled table tops and breakfast sets.

This offers a typical example of the many simple but effective demonstrations which can be utilized by product manufacturers to again "sell" the advantages of porcelain enamel as a finish.

Boehler to Murray's Detroit Plant

Word comes to *finish* that J. J. Boehler, formerly with the Murray Corporation in Scranton, Pa., is now superintendent of manufacturing control in the body division of Murray's main plant in Detroit.

A.G.A. nominations for 1947-48

General and sectional nominating committees of the American Gas Association have announced their selections for officers for the 1947-48 Association year, subject to elec-

tion at the annual convention in October.

Hudson W. Reed, president, The Philadelphia Gas Works Co., Philadelphia, has been nominated for president. Other selections include Robert W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs, for first vice president; Hugh H. Cuthrell, vice president, The Brooklyn Union Gas Co., for second vice president, and Edward F. Barrett, president, Long Island Lighting Co., for re-election as treasurer.

Aydelott returns to Murray

It has been reported that Elliott C. Aydelott, who has recently been engaged in consulting engineer work, is now with the Murray Corporation in Scranton, Pa. Before World War II he was with the Murray organization in Detroit. Prior to that he was with the Frigidaire Division of General Motors and also with the Benjamin Electric Company in Des Plaines, Ill.

Bellaire installs furnace

The Bellaire Enamel Co., Bellaire, Ohio, has completed installation of a modern continuous furnace which replaced several box type units, according to a recent report.

First heater comes off line in new Duo-Therm plant

In mid-August the first fuel oil space heater came off the assembly line in the new three-million dollar plant of the Duo-Therm Division, Motor Wheel Corporation, Lansing, Michigan, according to a company report.

Pemco completes sixth wholly continuous smelter

Pemco Corporation has just completed its sixth wholly continuous smelter unit, according to an announcement by H. G. Wolfram, vice president in charge of manufacturing for the company.

This new addition, said to be the largest wholly continuous smelter ever built for the smelting of porcelain enamel frit and ceramic glazes, is expected by company officials to

increase Pemco's production capacity on these items more than fifty per cent.

New jobbing plant at Lansing

Equipment is being installed in a new Quonset-type building which is to house the porcelain enamel jobbing plant of Lansing Porcelain Enameling Corporation, a new concern organized at Lansing, Mich.

The plant will be equipped for general jobbing work on signs, stoves, refrigerators, etc., according to John J. Steencken, president. Other officers of the company are George Grimes, formerly of Gibson Refrigerator Co., vice president, and Ivan McLean, of Quality Sign Co., secretary-treasurer. Joffre Filion and Leon Harvin, both of Lansing, complete the company's five-man board of directors.

Seeger advances three men

According to an announcement by Walter G. Seeger, president of the Seeger Refrigerator Company, three key men have been advanced as fol-

lows: N. H. Griebenow, vice president in charge of manufacturing, at both St. Paul and Evansville Divi-

sions; L. K. Sosey, works manager, St. Paul Division, and J. W. Seeger, superintendent, St. Paul Division.

A "man-sized" hydraulic press



The Verson Allsteel Press Co., Chicago, Ill., recently announced the introduction of a new 1500-ton straight side hydraulic press. Standing 38 feet high, the new press measures over 19 feet in length and 10 feet in

width. The stroke is 48" with 88 $\frac{3}{4}$ " of daylight. Bed area is 96" by 144". Total weight is approximately 500,000 lbs.

The press features fast advance to the work with automatic shift to full

*Three
Elephant*

BORAX and BORIC ACID

Products of American Potash and Chemical Corp.

IMMEDIATE DELIVERY

for full information and prices, write, wire or phone... CHerry 0296

FERRO CHEMICAL CORPORATION

Successor to W. B. Lawson, Inc., and Ferro Drier & Chemical Co.
(Subsidiary of Ferro Enamel Corporation)

Union Commerce Building

Cleveland 14, Ohio



Remember the name FERRO CHEMICAL CORPORATION

MANUFACTURERS: Driers for Paint and Varnish, Printing Ink, and Allied Industries.

DISTRIBUTORS FOR: Aluminum Ore Co.; American Potash & Chemical Co.; Darling & Co.; Duquesne Smelting Corp.; Lindsay Light & Chemical Co.; Philadelphia Quartz Co.; Stauffer Chemical Co.; Tennessee Corp.; Virginia Carolina Chemical Corp.; Wyandotte Chemicals Corp.; and others.

pressure stroke, thereby eliminating high-speed impact, say Verson engineers. Reversal is automatic on pressure or distance. Full electrical push-button control is provided for automatic operation with control stations for four operators.

The press is equipped with cushions in the bed, having a capacity of 500 tons and a stroke of 24". The die set alone weighs 74,000 lbs.

Shown in the photograph, standing on the platen of the big press, are, left to right, Lou Gricus, erection foreman, D. C. Verson, president of Verson Allsteel Press Co., and Sam Mazurek, factory superintendent.

New slide film to be shown at PEI Sales-Management Conference

A new full color "quicky" slide film for continuous projection, showing a visual demonstration of the qualities and versatility of porcelain enamel, suitable for retail merchandising, will be exhibited as part of the Demonstration-Display Clinic at the Sales and Management Conference to be held during the Porcelain Enamel Institute Annual Meeting in Cleveland, October 9 and 10.

Distribution plans for the film are being studied by the Institute's Market Development Committee, and will be announced during the Conference.

Hotpoint manufacturing appointments

The board of directors of Hotpoint, Inc. has elected B. E. Schroeder vice president of manufacturing. He was general superintendent of the aviation motor plant, Buick Motor Company, Melrose Park, during World War II. Recently he had been engaged in production management with Buick at Flint, Michigan. He had been with General Motors since his start as a production worker in 1924.

Patrick W. Ryan, with Hotpoint plants in Chicago for 16 years, has been promoted to general superintendent, and M. E. Maurer has been promoted to general manufacturing engineer from his former work on special technical assignments, according to an announcement by James J. Nance, president of Hotpoint.

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The nature of enamel adherence

(Continued from Page 39)

no adherence exists, and that when careful X-ray analyses are made the ferrous phase may be present in small amounts both when good adherence and no adherence is obtained. The oxide theorists, on the other hand, claim to have shown the presence of the ferrous phase only when adherence is good.

The etched surface theory

Mention has been made of the etched surface theory. This theory postulates the gripping of the enamel to a rough surface. Here attractive forces which are thought to be normal to the surface seem to be confused with frictional forces which are parallel to the surface.

Some experiments on joints between optically smooth surfaces of mild steel, employing shellac-creosote cement as an adhesive, have shown that smooth surfaces produce stronger joints than rough machined surfaces. Publications of the Forest Products Laboratory indicate that when the same glue is used, a porous wood is likely to produce a weaker joint than a dense wood.

The most potent argument against an etched surface as a factor in enamel adherence is that a good bond between the conventional ground coat and the ferrous metal base is stronger than the enamel itself. No mechanical joint can be stronger than the weaker of the materials that contribute to the joint.

Consider Figure 2—a sketch of a dovetail joint. One would expect that the weakest part of this joint would be along the line AA or A'A' and that it would fail when placed in tension along one of these lines rather than along the line BB or B'B'. It was mentioned previously that when a piece of wood is properly glued to a well bonded ground coat the enamel fails within itself rather than at the interface between the ground coat and the metal. In effect, it fails along the line BB or B'B' rather than along the line AA or A'A', that is along the strongest line rather than along the weakest line. Of

course, this could not be true.

Several years ago an effort was made to study the ground coat-steel interface with a microscope. Ground coats containing 0%, 1.25%, and 2.50% cobalt oxide were prepared and fired on enameling iron plates in the usual manner. Sections were cut, polished and examined under the metallographic microscope. Photomicrographs of these sections are shown in Figures 3, 4, and 5. It is noted that the ground coat containing no cobalt oxide presents a rougher contact line than any of those containing cobalt oxide, and yet the adherence of the latter was much greater than that of the former.

The above facts raise considerable doubt as to whether the roughness of the surface of metal base before or after firing has any direct significance with respect to the adherence of enamels.

Adherence and coefficient of expansion

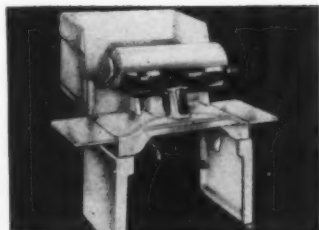
One frequently sees or hears the statement that two materials will adhere if their thermal coefficients of expansion are the same. Such a statement is somewhat misleading and requires clarification. A better statement is: If two adhering bodies have approximately the same coefficients of thermal expansion, the adhering bonds represented by forces perpendicular to the surface are not so likely to be ruptured by stresses exerted parallel to the surface and arising from differential thermal expansion. One might conceive of a situation, therefore, in which the coefficients might differ widely if the bonds between the two joined substances and the compressive or tensile strength of the materials are sufficiently great. In fact, the coefficient of expansion of the normal ground coat is of the order of 9×10^{-6} from room temperature to the softening point and that of iron is about 10.5×10^{-6} over the same range.

In the literature on glass-to-metal seals are found such statements as the following:

"... the value of the coefficient is relatively small in comparison with the total expansion or elongation curve. As a rough gauge in choosing glasses to match a particular metal it is safe in general to say that the difference in expansion coefficients should not exceed 1×10^{-6} per degree centigrade although this need not be true for certain external seals and is never true for thin edge, thin edge tubular, internal thin-walled tube and certain ribbon seals. ... An ideal relationship would be one in which the expansion curves for glass and metal are exactly superimposed or very closely parallel over the entire temperature range up to the softening point of the glass. ... The next preferable relationship is one in which the expansion curve of the glass coincides with or is closely parallel to the metal expansion curve and crosses the latter in the annealing range of the glass. ... In practice it is necessary to choose a glass and a metal whose expansions approach as nearly as possible to the above ideal relationship."

It is obvious from the several theories presented in this article that considerable disagreement exists among those who have studied the subject of enamel adherence, which disagreement, in view of the importance of the problem, is a directive for more extensive research. It should be kept in mind that by far the greater part of the research to date on enamel adherence has been concerned with the special case—the adherence of cobalt-nickel ground coats to enameling iron or steel. The general case of glass-to-metal adherence should also be the subject of intensive research.

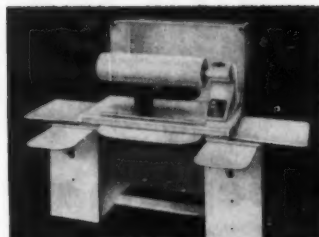




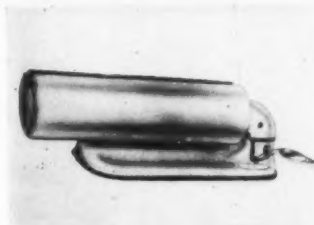
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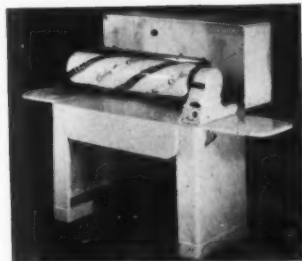


Bendix

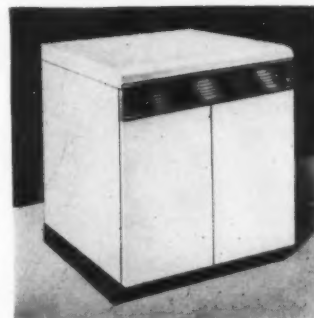
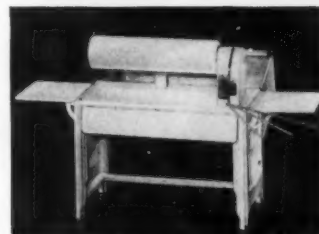


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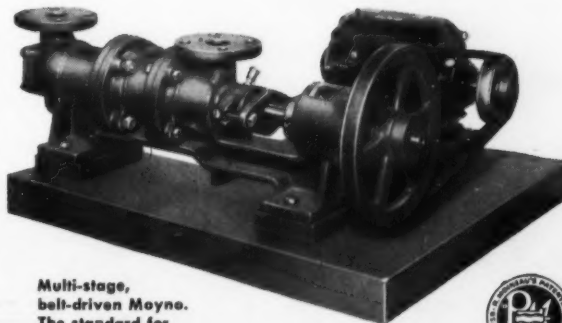
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The sheet steel problem

(Continued from Page 25)

Table III.
Growth of Output of Sheet and Strip Steel
(Exclusive of Tin Plate)

	Tons	% of Total Steel Shipped
1920	3,475,000	11
1929	7,700,000	19
1939	10,341,577	33
1940	12,325,257	27
1941	15,743,829	26
1946	14,140,198	29
1947 Rate	17,802,603	29
Estimated by A.I.S.I.		
1948	(1st Half 19,000,000	
1948	(2nd Half 20,000,000	
1949	20,600,000	

Table IV.
Projected Shipments Sheet and Strip for 1947

Grade	Based on 4 Months 1947	% Variation From	
		1946	1941
Hot Rolled	8,868,906	+29	-2
Cold Rolled	6,804,762	+27	+57
Galvanized	1,576,410	+8	-3
Other	552,525	+27	-26
	17,802,603	+26	+13

I have every reason to believe that this same policy prevails throughout the steel industry.

The question of sheet steel capacity

On the problem of sheet steel capacity, when we look at sheet steel production in relation to capacity, we see that the demand for sheet steel has been one of constant growth. (See Table III.)

World War II had a tremendous influence in developing new uses for sheet steel, and the present high cost of castings is swelling this development to unprecedented proportions.

The present breakdown by type is shown in Table IV.

As to whether this prospective increased output will meet demand, that is questionable. The fact is that sheet steel supply is as tight as it has been at any time since the war's end.

The automobile industry in passen-

ger cars and trucks is operating at a 97% production rate to what was their annual output in 1941 and at a 92% rate in passenger cars. The automobile industry normally uses around 30% of all the sheet steel produced.

In the world steel picture, the United States has increased its overall steel production by 30,000,000 tons since 1937, while Europe as a result of a coal shortage is down 25,000,000 tons from normal. Japan is producing about 5,000,000 tons a year less than it did in 1937, also

Purchasing with a purpose

(Continued from Page 27)

Harrington Emerson's principles applied to your department will make the work of the department more productive, but they should be tied together and made effective by seeing that proper rewards are given to everybody deserving recognition. The simplest type of a reward is pay-

due to a shortage of coal and scrap iron.

Steel production here is, therefore, offset by a corresponding lowered production of steel in Europe and Japan. This condition does not indicate any immediate hope that steel production will catch up with demand.

In conclusion, it is my belief that the steel industry in the United States fully recognized its obligation to the economic welfare of the nation. Time has proved that steel men have an inherent patriotism and a sense of social responsibility. Despite its creative genius and its portentous power, it has the possible fault of being ultra conservative. In the face of charges and countercharges it has rarely raised its voice.

Sheet steel was one of the raw materials of the recent war, and the men who made the Controlled Materials plan click are just as eager to make the inadequate supply reach as far as possible and as fairly as possible.

The abolishment of the Pittsburgh Plus Selling System in 1938 set up a serious handicap in that it forced most steel companies to favor marketing their products in surrounding areas. . . . Even so, it is my firm belief that the steel industry is striving with all its might to meet the unprecedented demand for steel . . . to plan for developing an adequate supply of fine quality at the most economical cost . . . to sell their product honorably and honestly, and to distribute it as equitably as it is humanly possible to do.

Adapted for finish from a talk before the American Washer and Ironer Manufacturers' Association.

ing adequate wages for adequate work. Also, to make the work of the purchasing department of value to the other departments in the organization, there is the management report.

Purchasing agents, as specialists in vendor relations, are in a position

to know what is available in the markets of the world and what these materials and services should cost and do to produce better materials for less money. They know, too, how these materials and services can benefit their own organization. You in the purchasing department, who make contacts every day with other departments in your own organizations, are familiar with all that goes on, the demands of the various departments, their requirements and services. Too often in the past the purchasing department, with its pressure of work and shortage of personnel, has given little thought to combining the knowledge, which it has as a result of its work, so it can

be passed on to others who might make good use of this information.

Through the management report, purchasing can appraise others in management of purchasing activities, inform them of the problems involved in purchasing, and point out certain courses of action as a result of situations arising outside of the purchasing department.

The purchasing agent as a specialist in vendor relations is a partner of management and, as a purchasing agent, his job is just as big as he wants to make it.

This summary was especially prepared for finish by the author from his talk before the AWIMA meeting.

A new challenge to purchasing

(Continued from Page 26)

chasing agent to see that he buys value. . . .

Many suppliers' representatives today are qualified engineers whose service and time are as much the buyer's as though he were on your own company's payroll. Thus, your suppliers are able to enhance your position as a buyer, as well as your company's position. . . .

As a purchasing specialist you should have a practical knowledge or, at the very least, an intelligent reading knowledge of usages of material and the methods of production of material. This does not mean that you must be a highly technical specialist in every field of enterprise. Obviously that is impossible, but you should have enough knowledge to recognize new materials which might be applicable to your own production.

Management overlooks the "P.A."

Management almost universally overlooks the P.A. as a tremendous potential source of new ideas and suggestions. They usually put the purchasing agent off in a corner of the room with the rest of the general office force, give him an old battered desk and a table to hold his records, and then brush their hands with the idea that they have left a man with a simple job. Man-

agement should consider the purchasing agent as a source of development equal in many ways to the most vaunted engineering group. If buyers, especially the new ones, are going to give this service to management they must abandon the position held by a few that every new thought or product presented by a supplier is a new way of affecting a subtle hold up. Be willing to call in the factory superintendent when products are being discussed with the salesman. Read some of the technical literature which arrives in every mail. If there was a fuller appreciation of the money spent in the preparation of the technical matter, less of it would go into the waste basket. Part of your job is the increasing of technical knowledge and the knowledge of material, its use and production, and in the long run is actually the thing that will make you either a mediocre buyer or a successful purchasing agent. . .

To me the Purchasing Department is the finest of colleges for the training of salesmen and I believe every salesman should spend some time in his firm's Purchasing Department to see how others do a job of selling. There he will learn that taking up a purchasing agent's time by letting him in on all their family troubles is not good selling. At the

same time he will learn that purchasing agents are paid to be currently informed and buying profitably. . .

The responsibilities of management, purchasing and suppliers

I have tried to point out that certain responsibilities exist between three units: Management, Purchasing and Suppliers. The fulfillment of these responsibilities will lead to more friendly relations on all sides, but even more will lead to greater benefits for all represented. Suppliers must be responsible for making promises in good faith, and send out representatives who are well informed; they should have as large an interest in helping the purchasing agent as in profits for the company they represent. In turn, the purchasing agent must indoctrinate himself more fully, especially the new man, in the fact that suppliers can be of immeasurable assistance. He must fully realize that there is a difference between the words Delivery, Price and Value. He must also realize that in dealing with salesmen who are specialists in their own fields a certain amount of his (the purchasing agent's) time must be allotted to interviews, thus increasing his personal knowledge and through their aid determine in a large measure his success or failure.

You purchasing agents are responsible to your management to obtain value in your purchasing; to recognize and call attention to new ideas in the industry; to keep the relations between supplier and management at a high level; and finally, to be a source of extensive knowledge on matters of materials and production methods. Last of all, management must recognize and treat the purchasing department as one of the most important in the organization. . . .

We all know from experience that manufacturing plants, distributing organizations, etc., cannot operate if they cannot sell as well as buy. Because they are dependent upon each other for their business existence, and since neither can stand alone, it seems strange that some-

to Page 64 →

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